

FURTHER OBSERVATIONS ON SOME LITTLE KNOWN TROPICAL AND SUBTROPICAL DISEASES INTERNAL SURGICAL AND CUTANEOUS

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In a paper published in the *Anais do Instituto de Medicina Tropical de Lasboa* Vo vi December 1949 I gave brief accounts of some diseases which have so far attracted little attention owing probably to the fact that most of them may be considered minor ones although at times causing great discomfort to the sufferer and also owing to the fact that their descriptions were generally published in local medical journals with scanty circulation I propose in this paper to treat further the subject dealing also with a few diseases which cannot be considered tropical and discussing also some little known clinical symptoms and signs and some little known methods of treatment

For purposes of convenience the subject will be treated under the following headings (1) Climatic Diseases (2) Fevers (3) Internal Diseases (4) Diseases of the Genito Urinary System (5) Diseases of the Organs of Special Sense (6) Surgical Diseases (7) Diseases of the Skin

I CLIMATIC DISEASES

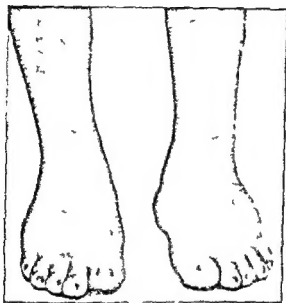
«ADEN ŒDEMA»

(Red Sea Œdema Heat Œdema)

The term Aden Œdema or Red Sea Œdema is a popular term used to denote an oedematous swelling of the feet and legs which is extremely common among passengers on steamers plying to India and the Far East. The condition develops very rapidly as soon as the boat reaches the southern portion of the Red Sea hence the term Aden Œdema or Red Sea Œdema. The feet and legs become somewhat swollen and slight pitting on pressure may be provoked there may be some feeling of discomfort and larger boots and shoes may have to be worn. The general health remains good the urine is normal and the reflexes are not altered. This condition often puzzles young ship's doctors during their first trip to the tropics. The old generation of newly appointed ship's doctors generally suspected heart disease or renal disease. The younger generation of ship's doctors who have attended courses of tropical medicine in Europe before being appointed often suspect incipient beri beri and other avitaminic conditions.

Aden Œdema and Red Sea Œdema is not limited to the Red Sea and Indian Ocean. It may develop in many other parts of the tropical zone both on sea and land. It may also occur in the temperate zone during a severe heat wave. Some years ago while in London during a particularly severe heat wave in the summer I was consulted by three patients — women — complaining of great swelling of the feet and legs with a feeling of discomfort slight pain and heaviness. The general condition of health was good there was no fever. The blood and urine were normal. There was no history or sign of varicose veins. In one case the swelling was truly enormous and the first impression on seeing the patient was that she was affected with elephantiasis glabra. The condition had appeared very rapidly two days after the beginning of the heat wave. On pressure there was some pitting although not very marked. As soon as the heat wave was over the swelling disappeared rapidly and the leg became normal in size. Unfortunately the lady refused to have photographs

taken Heat œdema is easily differentiated from œdema of renal and cardiac origin by the absence of albumin in the urine and by the examination of the heart being negative. It can readily be differentiated from the œdema found in incipient beri beri by the history by the excellent general health by the deep reflexes being normal (in incipient beri beri the reflexes are increased while later on they



A case of Aden Œdema

are lost) and by the fact that it disappears as soon as the weather becomes cooler or if the patient is placed in a conditioned air room. In women it must be differentiated from endocrine pseudo œdema or endocrine solid œdema not rarely found in cases of thyroid and ovarian disturbances. In these cases there is no pitting on pressure the swelling is often more marked just before the menstrual periods and if these are delayed the swelling becomes much worse. Some years ago I attended a young woman sufferer in whom the menstrual periods had been absent for about three years. The swelling

of the ankles disappeared completely when menstrual function became normal

Aden CEdema (Heat CEdema) must be differentiated from the oedematous condition of the legs occasionally developing after an individual especially a woman has exposed her legs for some time to the sun In these cases the skin is reddened and later pigmentation follows the condition being in reality a form of dermatitis solaris

«PES DOLOROSUS»

(Pis dolorosus mitis)

I first noticed this condition in people generally women of northern extraction residing in Rome I have found it also in Northern Egypt and Lybia but it appears to be rare in countries situated in the true tropical zone The patient complains of severe burning and tenderness and a feeling of swelling of the feet She often describes the condition as «fever of the feet» and says she has frequently to kick off her shoes The condition is aggravated by walking and exercise though it is not caused by it since it is often present on getting up from bed in the morning The objective examination shows very little if anything abnormal As a rule there is no diffuse redness and the arteries are not throbbing At times however the whole foot particularly the instep has a slightly swollen appearance although usually no pitting is produced on pressure There is no fever and the general health is not affected A change to England or to the mountains causes a rapid disappearance of the symptoms When the patient is unable to take a change I have found warm foot baths using the following powder very beneficial menthol grm 0.30 methyl salicylate grm 0.75 aluminis grm 100 boracis grm 100 Two heaped up teaspoonsful in a basinful of warm water The condition has to be differentiated from erythromelalgia Erythromelalgia or red neuralgia is a somewhat rare condition it is commoner in males than in females the pain is intense particularly when the limb hangs down but disappears on rest The affected parts are bright red with throbbing arteries and enlarged veins

Pes dolorosus is to be differentiated also from the so called «Prisoners camp foot» (also known as «Electric foot» «Malnutri-

tion foot» and «Starvation foot») a much more serious condition due in all probability to prolonged scanty diet with lack of proteins, fats and vitamins common during the last war in prisoners' camps in the Far East. In this last condition the pain is excruciating especially at night and the patient remains awake the whole night continuously rubbing his feet or placing them in cold water to get some slight relief.

«CACOPHORIA TROPICALIS

The term «euphoria» is often used to denote the feeling of «bien être» usually experienced when all the organs and systems of the body are functioning at their best. The term «cacophoria» (from the Greek *kakos* — ill, bad) might be used to indicate the opposite condition so common in the tropics even among people who are apparently healthy and who do not commit excesses in food and drink or in other ways.

One feels constantly tired and below par and everything is an effort. This feeling which is particularly marked in the morning on rising and which lasts for several hours or even the whole day is often described by the old Indian residents in the popular and well known expression «I'm feeling like a worm». The condition differs from the many forms of minor neurasthenic complaints found in the tropics; the principal symptoms are bodily fatigue, mental lassitude and principally lack of the sense of complete health and well being; one does not feel particularly «nervy» or irritable.

The condition is probably of endocrine origin, the climate no doubt having a much greater influence on the endocrine glands than is generally supposed. The best treatment is of course a trip to Europe but this seldom being possible frequent changes to some hill station are to be recommended. In cases where such changes cannot be carried out a tonic containing nuxvomica and hypophosphites or glycerophosphates may be given though the results are seldom very satisfactory. In some cases glandular extracts, principally testicular and suprarenal and multiple vitamins may be tried but as a rule the results are not brilliant.

«MORBUS BOREAE»

(Syndromes due to certain winds)

Different winds produce different effects on man and physiologically they may be separated roughly into two groups (a) with stimulative action e g tramontano and (b) with depressing action e g sirocco. Certain local winds in the tropics and subtropics may give in some individuals well defined groups of symptoms almost amounting to true clinical entities. I may mention the ghibli syndrome and the harmattan syndrome.

Ghibli syndrome (Ghiblitis) — The ghibli is a violent south or southeast wind blowing into Tripoli (Lybia) from the desert and carrying with it a quantity of sand. The effects have been studied by Onorato (1924) and more recently by me (1940-43). Most people suffer but little from it except perhaps some slight discomfort but certain individuals manifest serious symptoms: there is great nervousness and irritability often accompanied by sleeplessness, headache and neuralgias, the eyes ache and the conjunctivas are irritated and there may be photophobia and lachrymation. There is a feeling of general malaise with loss of appetite and disinclination to work and some individuals have actually to rest in bed and be given bromides or luminal.

Harmattan syndrome — The harmattan is a hot easterly wind coming from the Sahara Desert and carrying dust far out into the Atlantic. In the months of November to March this wind meets with the north east trade wind in its most southerly position with the result that it is deflected southwards down the west coast of Africa. It is a very dry wind and consequently extracts moisture from everything it comes across: furniture creaks and groans in a most supernatural manner. Human beings feel their skin dry and hard; in some individuals a somewhat serious syndrome develops characterized by excessive dryness of the skin with formation of deep fissures, bleeding from the nose and lips and severe general malaise.

Wren has graphically described the Harmattan as «that terrible wind that carries the Sahara Desert a hundred miles to sea not so

much as a sand storm but as a mist or fog of dust fine as flour filling the eyes the lungs the pores of the skin the nose and throat getting into locks of rifles the works of watches and cameras defiling water food and everything else rendering life a burden and a curse»

The Khamsin — The khamsin or khamseen is a dust laden wind which blows in Egypt usually for 3 or 6 or 9 days a time during a period of 50 days (khamsin means 50) about Easter time It is very disagreeable especially when associated as it often is with high air temperatures when it may produce pathological changes in persons in poor health living in places unsuitable for bearing heat such as railway trains

The Sirocco (Italian *scirocco*) — The sirocco is a south-east wind with a high temperature which coming from the high land of North Africa descends to the Mediterranean and may reach Malta and some parts of Italy It is considered to be very enervating Certain authorities believe this wind to be of the nature of the foehn (see below)

The Solano — The solano is a south easterly wind blowing from the Sahara into Spain

Pamperos — These are the south westerly winds of Brazil Europeans have altered the significance of the name to signify cyclonic winds in the same vicinity

The Foehn — Though essentially a temperate or cool climate wind still the foehn exists in the tropics The foehn is found in its home Switzerland, as a warm dry wind which blows with great violence downwards from the crest of the Alps and has marked effects upon man and animals having a depressing effect upon the mind and the nervous system It was thought at one time that this wind came from the Sahara but all evidence is against this and the present view is that it is a local wind which is produced by a high south east and a low north west pressure and attains its high temperature as well as its dryness in its descent from the summits of the Alps on the northern side and less typical on the southern aspect when the pressure is high in the north west and is low in the south-east.

LAND WIND

In every tropical country near the sea one hears a great deal of the «land wind» During the day the land becomes heated by the sun and causes the air to rise thus lessening the pressure and drawing

the air from the sea causing a sea breeze which is of course very humid During the night moreover by terrestrial radiation the land (as a rule is dry and has a deleterious effect on men and animals by) becomes cooler than the sea and constitutes the land wind The wind extracting moisture and abruptly cooling the body and thereby lowering the power of resistance to disease Hence the complaints made by old residents about the land breeze as giving muscular



A sand storm approaching Khartoum (Sudan)
(Courtesy of G W Morhig)

rheumatism and «chills» On the other hand newcomers delight in them because they are so cool

«SAND STORMS»

Any of the winds mentioned except the land wind which is too mild may give rise to sand storms which cause great discomfort and may at times be dangerous

Sand storms occur in several parts of Africa especially the Sudan and Lower Egypt they also occur in certain parts of North America as for instance in Colorado

American writers have described as deadly some sand storms occurring in Kansas Colorado New Mexico Oklahoma and Texas The sun is completely blotted out and it is as dark as midnight Traffic is stopped all airplanes are

grounded schools are closed because the children could not reach their classes without choking. To anyone stumbling and falling on the ground there is danger of being suffocated by the dust.

«MOONSTROKE»

The old stories and exaggerations on the effects of the moon rays have brought discredit on the subject. There is no doubt however that long exposure to moon rays especially sleeping in the moonlight may cause headache and irritability. Sailors believe that it may produce sudden night blindness and giddiness which they call «moonstroke». As is well known in ancient times it was believed that epilepsy and mental disease were due to lunar influence hence the term lunatic.

Menstruation and pregnancy were also supposed to be under lunar influence. It was believed that the majority of women were free from menstruation during the full moon and for that reason the most ancient celebrations and bacchanalia were set at that time. It was also believed that the day of the full moon was the best day for marriage.

2 FEVERS

In the tropics and subtropics there are a number of fevers which are very little known a few of which I will now briefly discuss.

NON MALARIAL QUARTAN FEVER

It is still considered an axiom in medicine by some authorities that a fever showing a quartan periodicity is malaria. There is however a quartan fever of non malarial origin which I described years ago in local publications in Ceylon. A description of it was also given in Castellani & Chalmers Manual of Tropical Medicine 1919 pag 1470 and also in my recent Manual on Diseases of Africa (Rome 1947). It is a very rare fever. The patient has an attack of fever every fourth day the temperature going up to 103 or 104 F and even more. At the beginning of an attack there may be a mild shivering fit but this may be completely lacking. When the tempe

perature goes down there may be sweating but this is also not a regular feature. Malaria parasites are absent from the blood and quinine given in massive doses either by mouth or by intramuscular or intravenous injections has no effect whatever on the course of the fever which is prolonged lasting for several months. The laboratory tests for Brucellosis and other infections are negative. In the three cases I have observed neither the spleen nor the liver was palpable.

In addition to this type of quartan non malarial fever which some observers designate with my name and the aetiology of which



Quartan like fever of non malarial origin (Ceylon case)

is not known there is in my experience a quartan fever of syphilitic origin (*Febris quartana luetica*). It is however extremely rare. I have seen only one case: a man of forty who had never been in a malarious region consulted me in London in 1925 for a fever which was occurring every fourth day. His general condition of health was good. I had him under observation for a month and every fourth day there was an attack of fever: no true shivering fit and the temperature never rose higher than 103°F. There were no sweatings. Malaria parasites were constantly negative and quinine in massive doses (45 grains daily) had no effect. Wassermann was positive and a neoarsphenamin treatment cured the condition.

In recent years a fever with a quartan periodicity has been described in a few cases of septicaemia due to *Neisseria meningitidis*. It responds to penicillin.

FEBRICULA AMOEBICA

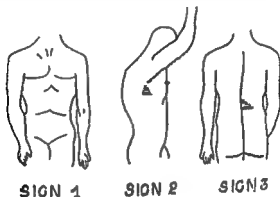
(Low amoebic fever)

This term is used to denote a fever usually of the intermittent type which is of amoebic origin although intestinal symptoms and signs are absent and the examination of the stools for *hystolytica* cysts may be negative very many times. In one of my cases cysts were found only on the 45th stool examination. The patient is usually in a fairly good general condition of health but complains of feeling feverish and tired usually in the afternoon the temperature seldom rising above 38 C. These cases are of very difficult diagnosis as the practitioner owing to the absence of intestinal symptoms seldom thinks of the possibility of amoebiasis and even if this suspicion occurs to him the examination of the stool is usually negative unless repeated very many times. The examination of the blood generally shows no abnormality except at times a slight degree of hypochromic anaemia, no leucocytosis, no eosinophilia.

In these cases a thorough clinical examination of the patient will often be of more value than the laboratory investigations. Fairly frequently in these cases one or two or all three clinical signs of latent amoebiasis I described some years ago (*Journ of Trop Med & Hyg* Sept 1st 1939) will be found. These signs in all probability are due to the liver being affected although symptoms of definite hepatitis with fever, palpable liver and leucocytosis are absent.

1) *The Ensiform Tender Spot* — The patient lies on his back. Fairly heavy mediate percussion is carried out on a line drawn from the tip of the ensiform process to the umbilicus, this line being a prolongation of the mid sternal line. The percussion is carried from the umbilicus towards the sternum. When a spot is reached immediately below the ensiform process pain is felt by the patient as is often seen by facial wining. The symptoms may be elicited also by palpation, pressing the tip of the forefinger as various spots along the line. A similar tender spot is found also in cases of duodenal ulcer and at times of simple hyperchlorhydria but is usually situated somewhat lower down. The tender spot found in cases of cholecystitis is more to the right, just outside the right rectus muscle.

2) *Mid Axillary Dullness* — The patient lies on his back. Percussion (rather firm but not heavy — the same type of percussion used in defining the cardiac area with the Orsi Grocco method) is carried out along the mid axillary line. The upper limit of the dullness may be as much as 1 or 2 in. above the normal which usually is in the seventh space or on the eighth rib while on the mammary line the dullness of the liver has practically a normal limit which using this type of percussion is generally on the sixth space. The following procedure may be carried out with a dermatographic pencil the mid axillary line is traced. From a point two finger breadths (about 4 cm.) below the nipple a horizontal line is drawn meeting the mid axillary line at a right angle. If on percussion there is dullness at the spot where the two lines meet and for a short distance outside it, the sign is positive.



Sign No 1 — Subcostal tender spot

Sign No 2 — Upper limit of dullness on the median axillary line increased

Sign No 3 — Zone of dullness at right base (From Cannavò)

3) *Band of Dullness at the Right Base* — Percussing the back a zone of dullness is found at the right base in which the tactile fremitus is at times increased. The zone may have a triangular shape. This sign is probably due to the liver being enlarged and pushing the diaphragm upwards thereby causing a partial pseudo-consolidation or addensation of the lung tissue. In several cases however the dullness is present with fremitus much diminished or even absent although there is no fluid in the pleura.

The three signs may be present in the same patient but frequently only one or two are present.

Radiological researches have been carried out by Acanfora, Cannavò and others but not much light has been shown on the subject.

In my original communication on the subject (*Journal of Tropical Medicine & Hygiene* November 1 1935) I stated that the first sign is noted in about 15 per cent of cases of chronic amoebic colitis of the almost symptomless type. I have described the second in about 20 per cent. and the third in about 10 per cent.

of cases. My later experience is that occurrence of these signs is somewhat more frequent than I believed at first. One or more of them are apparently present in about 30 per cent of the cases. Pülle and other recent observers give a much higher frequency of all three signs (see P. P. II Congresso Nacional de Medicina Tropical, Lisboa, 1952).

Treatment — The treatment of amoebic low fever consists of giving antiamoebics the best in these cases being still emetine

FERRICOLA CLIMATICA

(Climatic low fever)

There has been great discussion on the existence of a truly climatic fever and there is no doubt that in the old days this term has been used to cover many cases of atypical typhoid undulant fever and many other febrile infections. I believe however with many



Febricola climata a (Ceylon case)

other tropical clinicians that climate per se may cause at times a low prolonged intermittent fever. The patient's general health is fairly satisfactory but every day usually about eleven a.m. the temperature rises reaching in the early afternoon a maximum of 37.5 C or a little higher and as a rule never exceeding 38 C. In the evening between 7 and 11 p.m. the temperature gradually goes down to normal. There are no shivering fits or sweatings and only very mild subjective symptoms are noted. The patient complains often of fatigue and occasionally of a slight headache. The patient usually goes on attending to his duties. It generally lasts three or four months and then gradually or at times suddenly ceases.

Diagnosis — Before making a diagnosis of climatic low fever every other kind of low fever should be excluded and especially *low fever of tubercular origin*. More than once in the tropics I have seen

cases which had been considered by the practitioner to be cases of climatic low fever develop clear signs of pulmonary tuberculosis. An X ray of the chest should always be taken in cases of low fever. *Prolonged low fever of malarial origin* is much rarer than believed at one time its diagnosis is based on the presence of malaria parasites and on the rapid beneficial effect of quinine paludrine atabrine and other antimalarial drugs. A low intermittent fever is common in *ankylostomiasis* but the anæmic oedematous aspect of the patient will suggest this infestation and an examination of the stool for ova will clear the diagnosis although it should be kept in mind that the low fever may continue for a long time after an adequate treatment has been given and the worms expelled. The fever in reality is of bacterial origin the small wounds produced by the worms in the intestinal mucosa become infected with various intestinal bacteria among which rather frequently *Bacterium asiaticum* (*Salmonella asiatica*).

There are many other low fevers as practically every specific pyrexial disease such as undulant fever typhoid paratyphoid etc is capable occasionally of presenting a low intermittent fever instead of the characteristic fever it generally gives rise to. With Jacono we have studied for instance cases of *prolonged low intermittent fever due to Spirochaeta recurrentis* and similar spirochaetes (difficult diagnosis microscopical examination never sufficient animal inoculations necessary) and a *low fever of syphilitic origin* is far from rare, (Wassermann positive responds promptly to specific treatment). A low fever always to be kept in mind in the tropics subtropics and many parts of the temperate zone is the *fever due to mild subclinical hepatitis* (Examine patient for slight enlargement of liver presence of subeniform painful spot on pressure presence of cysts in stools not rarely absent and if considered necessary carry out therapeutic test).

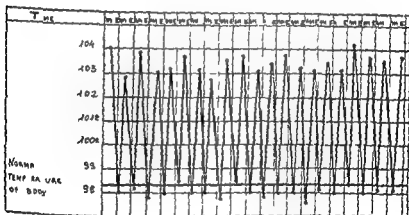
A *low prolonged fever of filarial origin* is not very rare it is usually due to *Wuchereria bancrofti* but apparently *Loa loa* and *Acantocheilonema perstans* may also occasionally cause it.

Cases of low fever are also due fairly frequently to focal infection of the nasal sinuses gums tonsils gall bladder appendix etc. There is also a *low fever of endocrine origin* being usually due to some degree of hyperthyroidism. Finally some authorities still admit

a low fever of hysterical origin especially in young women known as «hysterical low fever» (Search for hysterical stigmata such as bolus hystericus lack of pharyngeal and conjunctival reflexes pain on pressure of ovarian region and mammae Hysteria is far from rare in native women)

TROPICAL NON SPECIFIC ACUTE INTERMITTENT FEVER OF CHILDREN

This fever was described by me in 1909 in Ceylon Apart perhaps from slight anaemia the child does not show any symptoms



Tropical intermittent fever in children
(Portion of the temperature history of the Ceylon cases)

except the fever he takes his food well runs about and plays and seems apparently in his usual health The fever begins in the late morning and lasts several hours every day reaching to 103 to 104 F and more There is no shivering fit at the onset and no perspiration when the temperature falls to normal The blood does not show any abnormality except occasionally a light degree of anaemia The urine is normal — no sign of coli infection The spleen and liver are not enlarged and no intestinal symptoms or rash are present All laboratory investigations are negative The course of the fever is very

long at times lasting several months. With regard to treatment quinine does not influence it in the least but as a rule a change of climate stops the fever almost immediately. In the three cases I saw in Ceylon the fever stopped immediately the little patient was taken to Nuv ara Eliya a station in the hills from Colombo or to Conoor a hill station in India. In the case I saw in Lybia a few years ago every possible modern investigation was carried out both in Lybia itself and in Italy as soon as the child arrived there by air the fever ceased without any treatment on the fourth day after arrival.

«INSECT FEVER»

(Aspecific insect fever)

It is of course known to everybody that some insects carry and transmit to man pathogenic germs and viruses causing various fevers. *Anopheles* mosquito inoculate malaria. *Aedes aegypti* dengue. certain *Phlebotomi* e. g. *Phlebotomus papatasi* Pappataci fever etc. Much less known is the fact to which I have called attention several times that multiple punctures and bites of insects may cause per se feverish conditions for which I have introduced the collective term «Aspecific or Traumatic Insect Fever». I will say a few words on two varieties of it.

Aspecific Pappataci Fever (Traumatic Pappataci Fever)

In localities where phlebotomi abound it is not rare for a doctor to be called by an anxious mother to see her child who she thinks has developed measles. The child is restless and feverish but the thermometer seldom registers a temperature higher than 38 or 38.5 C. The face and exposed parts of the body are covered with red macules, maculopapules and papules and there may be some slight swelling. This somewhat blotchy rash may closely resemble the rash of measles. It does not affect however the covered parts and there is no coryza and no conjunctivitis. The rash is pruriginous but in some cases the pruritus does not seem to be very severe. The rash persists for a long time in fact until the correct diagnosis is made and the child protected from the phlebotomi or until the phlebotomus season ceases.

A similar clinical picture may be found in adults but is usually much less severe. It should be remembered that phlebotomids do not make any buzzing noise and the patient simply finds out that he has been «bitten» from the pruritus. At the spot where the insect has «bitten» usually a red maculo papule or a definite small red papule develops not a pomphus as is the case with mosquitos. The papule may persist 3-4 days and even longer.

In countries where the pappataci fever occurs the diagnosis of aspecific pappataci fever may be very difficult but in true pappataci fever the temperature is much higher and on the third day it drops by crisis. Moreover the face remains suffused for one or two weeks after the temperature has become normal (so called Castellani's pappataci diagnostic sign permitting a diagnosis of probability in retrospect). The treatment of aspecific pappataci fever consists in protecting the patient from the phlebotomids especially by the use of very small mosquito nets (which however are very uncomfortable) and by applying to the skin the following lotion which greatly allays the itching: menthol grm 1 alcohol purum grm 50 glycerine grm 2 zinci ox grm 5 aquae dest. ad grm 150. Shake well before using. Dilute with the same amount of water for the face in adults and the whole body in children.

DDT is very useful in the fight against phlebotomids.

Aspecific Mosquito Fever (Traumatic Mosquito Fever)

Where mosquitos swarm a somewhat similar syndrome may occasionally be noted with fever and severe malaise but the rash is chiefly urticarial while in aspecific pappataci fever it is papular. The diagnosis is made on the history and the presence of numerous most pruriginous pomphi and excoriations due to scratching.

I saw one extremely severe case of this condition a few years ago in an adult person at a sea side place on the Adriatic coast of Italy to whom the hotel manager had given a room which had been shut up for some time and contained some famelic mosquitos. During the night he was terribly bitten and the day after he felt seriously ill, nauseated and feverish and the whole body was covered by innumerable most pruriginous pomphi. The temperature in the axilla varied between 38.5 and 38.8 C and lasted for two days after he had been

moved into another room where there were no mosquitos All laboratory examinations were negative

Other Varieties of Insect Fever

There are several other aspecific insect fever - aspecific bed bug fever aspecific tick fever aspecific louse fever aspecific flea fever aspecific ant fever etc I have seen a few cases of aspecific louse fever and aspecific flea fever in Poland and in the Balkans Aspecific tick fever is not extremely rare in tropical countries Some years ago I saw a case in a young European child near Mogadiscio Italian Somaliland The child was feeling out of sorts and had had fever for about ten days and various diagnoses had been suggested Laboratory negative Finally a tick was found attached to the scalp hidden by the hair It was removed and all symptoms disappeared within a few hours

It may be mentioned en passant that ticks can be made to drop from a person by the application of ether or chloroform A very simple method is just to touch the tick with the lighted end of a cigarette

PEBRIS AESTIVALIS THROMBOPLEOCYTEMICA

(Roman Gardens Fever)

In Rome and in the south of Italy in general there are certain little known summer fevers somewhat resembling dengue or influenza for which the practitioner often uses the term summer influenza Similar cases occur in the Balkans and in North Africa In my cases the patient almost always gave a history of having passed the afternoon in the garden although he did not recollect having been bitten by insects and did not show any bites The fever begins suddenly with occasionally a chilly sensation but no true shivering fit The temperature rapidly rises to 39 C — 40 C and falls by rapid lysis on the 4th 5th 6th or 7th day and may occasionally show a saddle like graph No sweatings From the very beginning the patient complains of very severe headache and rheumatoid pains all over the body The face may be somewhat flushed but not so flushed as in dengue or pappataci fever There is no rash of any kind spleen and

liver are not usually enlarged. The examination of the blood shows absence of malaria parasites and the number of leucocytes is about normal. An interesting feature is the great increase in the number of bloodplatelets: in one case the number reached 800 000 in another 1 200 000.

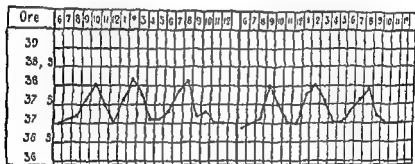
The fever is differentiated from dengue by the constant absence of the rash from pappataci fever by its course being somewhat more prolonged. Moreover in pappataci fever the face is much more flushed and remains flushed for many days and even weeks after the temperature has fallen (Castellani's sign). It is not malaria as the examination of the blood never shows malaria parasites and quinine, atabrin and paludrin have no action on it. It is not influenza as catarrhal symptoms are never present. It is not a fever of the typhus exanthematicus group as the course is much shorter and rashes are absent. It is not a fever of the typhoid paratyphoid group as it lasts only a few days and moreover all the laboratory investigations for that group of fevers are negative.

The treatment is palliative.

FEBRIS PLURINDIEM

This is a very rare fever of which I have given a description in my *Manual of African Diseases* (Rome 1947). It is of unknown origin and is characterized by the occurrence of two pyrexial attacks (*Febris bisindiana*) or three pyrexial attacks (*Febris terindiana*) the same day. Judging from the three cases I have investigated the first two in England the third in Italy the same patient does not show at times two attacks and at other times three attacks daily but constantly either two or three attacks. Each attack lasts two or three hours, seldom longer, does not begin with shivering and does not end with sweating. In my first case the patient was feeling very well in the early morning but at about 9 a. m. he began feeling very tired. His mind was confused and he felt feverish and the temperature rose to 38° C. without any shivering. At about 11 a. m. the temperature became regularly normal without any sweating or shivering. The patient felt well and his mind was quite clear. At 1 p. m. he had regularly a second attack with the same symptomatology which termi-

nated at five p m and at nine p m he had a third attack again with the same symptoms In the second case the patient used to have two attacks daily without shiverings and without sweatings The maximum temperature varied between 38 and 38.9 C In my third case there were three attacks daily of the same type The examination of the blood did not show anything characteristic No definite leucocytosis no eosinophilia All laboratory examinations for malaria filariasis undulant fever syphilis etc were negative and quinine was useless In the third case sulphonamide drugs were tried with no



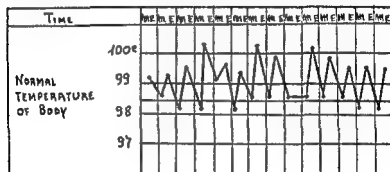
Temperature chart of a case of Febris plurindica (Febris terindica)
on two consecutive days

result Antibiotics were not available In all three cases the fever ceased four months after arrival in Europe from the tropics

ANKYLOSTOMIASIS LOW FEVER

Some authorities still consider ankylostomiasis a non febrile disease There is no doubt whatever however that in over 50 per cent of the cases of infestation with clinical symptoms a low fever is present This fever was described (see Castellani & Chalmers Manual of Tropical Medicine 1919) many years ago independently by myself and Gabbi The temperature rises every day usually in the late morning or early afternoon — maximum seldom above 100 F there are no shivering fits and no sweatings In all probability the fever is not due to the worm itself but to intestinal bacteria infecting

and rendering septic the small wounds produced in the intestinal mucosa by the worm and at times entering the general circulation. In several cases I have found *Salmonella asiatica* in the stools and the blood contained agglutinins for it. The term ankylostoma fever therefore is not quite appropriate. In a few cases the fever continues long after the patient has got rid of the ankylostomes by adequate treatment. In addition to the low intermittent type which is the most frequently met with there is a subcontinuous type and an irregular



Ankylostomiasis fever. Portion of the temperature chart of a Ceylon case

type at times intermittent at times subcontinuous there is also although extremely rare an undulant type.

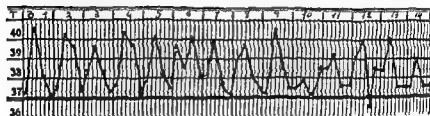
A similar type of fever may be found at times in ascariasis.

TOXOPLASMOSIS

(Toxoplasmic fever)

In 1913 I observed in Ceylon a case of chronic high intermittent fever with splenomegaly in which no malaria parasites were found and which did not answer to huge doses of quinine and terminated fatally. A full account of the case with micro photographs and a coloured plate was published in the Journal of Tropical Medicine & Hygiene April 15 1914. In films made from the spleen numerous oval or somewhat spindle shaped or somewhat crescent bodies 2.5-4.5-6 microns in diameter with blue staining cytoplasm and with one large

rounding mass of chromatin at one pole or in the centre were seen I called the parasite *Toxoplasma pyrogenes* Cast 1913. A similar parasite was found in 1916 by Fedorovitch in a case of splenomegaly in a child on the Black Sea coast and also by Chalmers in the Sudan in 1917. Micro photographs of the *Toxoplasma pyrogenes* were published in the 1919 edition of Castellani & Chalmers Manual of Tropical Medicine p 489 and a short description of the disease given on p 1035. It is interesting to note that my slides were exa



Toxoplasma pyrogenes

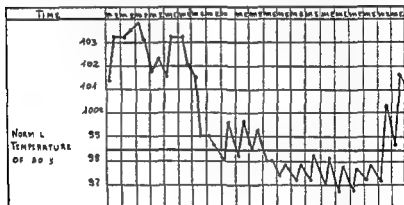
mined by a number of protozoologists including Mesnil and medical men in various countries and they all agreed as to their parasitic and protozoal nature the majority among whom Mesnil and James believing them to be toxoplasmata.

Wenyon however who had never seen the slides suggested some years later in a publication that the organisms were cryptococci and this statement has practically been copied by all subsequent writers on toxoplasmosis. I have little doubt that if workers on the subject will consult my old paper in the Journ of Trop Med & Hyg (April 15 1914) and examine carefully the coloured plate and photo

micrographs they will convince themselves that the bodies are toxoplasmata (See also correspondence *Journ of Trop Med & Hyg* April 1952)

COLUMBENSIS FEVER

This fever was first found by me in Colombo Ceylon many years ago (*Ceylon Medical Reports*) and a description of it is found in the third edition of Castellani & Chalmers *Manual of Tropical*



Columbensis fever Portion of the temperature chart of a Ceylon case with beginning relapse

Medicine (1919 pag 946) and also in my *Manual of African Diseases* (Rome 1947) Cases have been reported in India by de Mello in Ceylon by Spaar in the Sudan by Chalmers in the Balkans and Southern Europe by Lurie Conte Scotti Servino and others An excellent general account of the disease has been given recently by Servino (*Jour Trop Medicine & Hygiene* April 1954)

Etiology — This disease is due to *Bacterium columbense* (*Salmonella columbensis*) which I will discuss with a few other intestinal bacteria later As it is a non liquefier and as it produces acid and gas in glucose and several other sugars although usually not in

lactose and never coagulates milk it has been considered to be a *Salmonella* by many authors until recently

Its action on lactose is most peculiar as a rule there is no production of acidity or gas but from time to time — usually at long intervals months and years — it suddenly produces acid and gas in that sugar (glucose peptone water) although it never coagulates milk In fact the milk has tendency to become alkaline The phenomenon has been noted by myself and others many times I still have cultures of the original strains and I will be pleased to send them to any medical man interested in the subject

A few more remarks on the organism may not be out of place *Bacillus columbensis* — I use of course the term bacillus not as a generic term but merely as a convenient general term to denote any rod like organism was first isolated by me in a case of typhoid like fever in 1905 in Ceylon and mentioned at local meetings (Ceylon Branch B M A) but in subsequent years I considered it a non typical strain of *B. paratyphosus* B and not a separate species In 1913 I isolated it again from two cases of typhoid like fever one with urinary complications and came to the conclusion that the organism was a separate species of its own (Central f Bakt 1914 74 Bd Heft 3/4 p 197) and was pathogenic

The three strains were serologically culturally and biochemically identical The organism was a motile rod like aerobic (facultative anerobic) asporogenous Gram negative non liquefying non pigment producing germ gas fermenting glucose and a number of other sugars but not saccharose or raffinose produced indol negative Voges Proskauer The organism was a non lactose fermenter when first isolated (neither acid nor gas) but after subculturing for some time became suddenly a lactose fermenter (acid and gas) to become again a non fermenter (neither acid nor gas) after a few days This phenomenon has continued to appear from time to time till the present day

This phenomenon occurs also with cultures derived from a single cell It is interesting to note that during the periods of lactose peptone water gas fermentation the milk remains alkaline and does not become clotted It is also interesting to note that on Macdonkey's medium the colonies seem to be always permanently white

Apart from the phenomenon of occasional temporary lactose gas fermentation, the organism differs from the paratyphoid bacilli A, B, C (*Salmonella paratyphosa* S Schottmuelleri S Hirschfeldi) in gas-fermenting glycerol and in producing indol it differs from *Bacillus asiaticus* in non fermenting saccharose and in fermenting (acid and gas) dulcitol and in producing indol it differs from *Bacillus morganii* (*sensu stricto* no fermentative action on maltose) in gas fermenting maltose dulcitol glycerol

The taxonomic position of *B. columbensis* has been much discussed having been placed in many different genera *Bacterium* *Morganella* *Salmonella* *Proteus* *Escherichia* *Enteroides* The tendency at present is to place it in the genus *Esche*

richii although this is not correct according to the original definition of this genus (vide infra). The suggestion has also been made to place it in the genus *Enteroides* Castellani & Chalmers 1919. The definition of the genus *Enteroides* as given by Castellani & Chalmers in the Manual of Tropical Medicine 1919 p. 1941 is as follows: «Eubacteria fermenting glucose and lactose with production of gas. Milk not clotted». The definition of the genus *Escherichia* Castellani & Chalmers 1919 is «Eubacteria fermenting glucose and lactose with production of gas and clotting milk».

It is to be noted that strains wrongly labelled *columbensis* have found their way into certain Bacteriological Collections.

Morbid Anatomy — This is not known, no death having occurred among the cases studied.

Symptomatology — This is usually very similar to the symptomatology noted in a rather mild type of typhoid or paratyphoid, but roseola is not present and the spleen is usually not palpable. A common complication is pyelitis due to the same germ, and then the fever may take a relapsing character and may last for many months and may give a great deal of anxiety to the attending physician.

Diagnosis — This is based on the isolation of *Bacterium columbense* from the stools or urine with specific agglutinins in the blood while agglutinins for the typhoid and paratyphoid organisms, brucellae, etc. are absent.

Treatment — Chloromycin used in recent cases by Servino seems to give excellent results.

«BACTERIUM ASIATICUM FEVER»

(*Salmonella asiatica* parenteric)

Bacterium asiaticum (*Salmonella asiatica*) is an intestinal germ which is often nonpathogenic or has only a very slight pathogenic action. It may however at times cause a fever of which two varieties may be distinguished. The first variety resembles a mild form of typhoid, but no roseola is seen and the spleen is not usually enlarged. The second variety is a protracted low intermittent fever. It is interesting to note that the low fever occurring frequently in severe cases

of ankylostomyiasis is not rarely caused by it. The diagnosis is based on the presence of *Bacterium asiaticum* in the stools and the presence of agglutinins for it in the blood while the agglutination for the typhoid and paratyphoid organisms is absent.

For brief description of *B. asiaticum* see p. 1918.

«BACTERIUM ALKALIGENES FEVER»

(*Alkaligenes parenteric*)

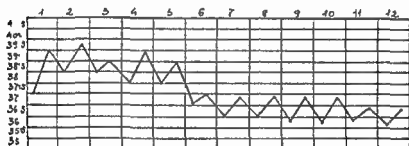
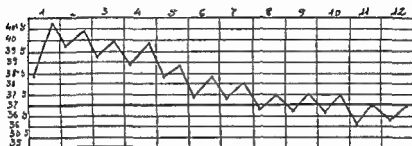
Bacterium faecale alkaligenes Petrusky and other species of the genus *Alkaligenes* though usually non pathogenic may at times cause a fever somewhat resembling mild typhoid but with no roseola and no enlargement of the spleen. Cases have been observed by Straub and Kraus, Sheaman and Chalmers and myself. The diagnosis is based on the presence of the organism in the stools and presence of agglutinins for it in the blood. The infection does not appear to react to the sulphonamide drugs and the antibiotics so far as I know have not been tried.

«ENTERO RHEUMATIC FEVER»

A full description of this fever which is far from being rare in Italy was given by me in the *Polichinco* volume 53 year 1946 and a fairly complete one may be found in my *Manual of African Diseases* (Rome 1947).

The onset is usually sudden with severe pains all over the body, complete anorexia, tongue heavily coated, offensive breath, severe diarrhoea or at times very marked constipation. There may be some abdominal pain but it may be completely absent. The fever is usually of a continuous or subcontinuous type with maximum of 39 or 40 or 40.5 C. It lasts about five to ten days and then the temperature gradually or rapidly falls to normal. (The two graphs are from two patients in the Rome University Clinic for Tropical and Subtropical Diseases 1945 in fact two assistants of the Clinic who became infected at a short interval one from the other). No rash. Spleen and liver not enlarged. The patient looks and feels very ill and prostrate.

Arthritic and myalgic pains last during the whole course of the fever but no swelling of the joints is noted. Pressure and active movement increase the pain. The examination of the stools which are generally strongly alkaline shows absence of bacilli of the dysentery typhoid paratyphoid food poisoning groups and absence of protozoa. Instead *proteus* is present in enormous numbers the examination of plates



Temperature chart of two cases of enteric rheumatic fever. The two patients were assistants in the University Clinic for Tropical Diseases, Rome.

made from the stools will reveal that usually more than fifty per cent of the colonies present are *proteus*, using the collective term *proteus* in its original meaning to denote intestinal asporogenous rod-like bacteria producing no pigment but liquefying gelatine and coagulated serum and often increasing the alkalinity of the media. The patient's blood about the fifth day of the fever and for weeks and months after agglutinates this organism as well as laboratory cultures of several other strains of *proteus* including *Proteus* X19. Organisms

Bacillus ceylonensis A (Cast 1907) (*Bacterium sonnei* Levine *Castellanus krusecastellani* Cerruti *Shigella sonnei* Weldon) Non motile non liquefying organism originally isolated in Ceylon from cases of chronic pyrexial colitis Does not produce gas in any sugar Produces acidity in glucose and after repeated transplantation in several other sugars Produces acidity in lactose very slowly and milk is clotted very slowly Indol negative Cerruti (1930) showed that *B sonnei* is identical with it The original strain is still available

Bacillus ceylonensis B (Cast 1907) (*Shigella ceylonensis* B *Castellanus castellani* Cerruti) Produces no gas in any carbohydrates acidity in glucose and several other sugars including lactose Indol positive Not agglutinated by *ceylonensis* A serum and *madampensis* serum

Bacillus madampensis (Cast 1911) (*Shigella madampensis* *Castellanus madampensis*) Indol positive Not agglutinated by *ceylonensis* A and *ceylonensis* B sera

To denote the group *Bacillus ceylonensis* B *B ceylonensis* B and *B madampensis* I introduced years ago as a convenient collective term the term metadysenteric bacilli Cerruti in 1930 created for this group the genus *Castellanus* differing from the genus *Shigella* in acidifying lactose and clotting milk The three species *ceylonensis* A *ceylonensis* B and *madampensis* can in practice be easily differentiated as follows *ceylonensis* A does not acidify dulcitol does not produce indol *ceylonensis* B acidifies dulcitol produces indol *madampensis* does not acidify dulcitol produces indol They can also be identified by serological methods as there is no cross agglutination among these organisms

3 INTERNAL DISEASES

Diseases of the mouth and fauces

STOMATITIS CRYPTOCOCCO BACILLARIS

This stomatitis was described by me in 1925 in Central America (Diseases of Central America Journal of Tropical Medicine & Hygiene Vol XXVIII : 1925) The condition is very different in appearance from ordinary thrush the patches which are generally somewhat diffuse are scarcely raised and are not creamy white They have the appearance of a thin translucent whitish film covering parts of the oral mucosa occasionally giving the impression of being patches of incipient leukoplakia but microscopical examination of

B Ceylonensis (Salmonella typhosa A), B Paratyphosus B (Salmonella paratyphosa B) B like bacterium

Org name	Gly of	L in Milk	I & I	Remarks
S columbensis (Morganella Salmonella Proteus Escherichia Enteroides columbensis)	A O	O	+	Differs from the paratyphosus C in gas fermenting glycerol producing indol Differs serologically from other salmonella organisms and other salmonella B <i>typhosum</i> in not gas fermenting and serologically Differs from <i>typhosum</i> in fermenting maltose and serologically will produce suddenly lactose peptone water which is acidified and remains alkaline
B asiaticus (Salmonella asiatica)	A O	A or Alk	S or O	
B faecalis (Proteus faecalis)	Alk or O	Alk	O	All typical strains produce gas Some strains peptonize milk
B proteus (Proteus proteus)	O or As	C or P	+	Some strains have different serotypes A Variety of malodorous products from fermentation of any sugar
B ceylonensis - A (Castellanus sonnei, Kruse-Castellani)	A or O	AC (very slowly)	O	Some strains on first inoculation in glucose and the acidification may be absent or extremely slow and Kruse & Post do dysentery to be identical with B
B ceylonensis - B (Castellanus ceylonensis)	A	AC	+	Differs serologically from <i>madampensis</i> and all other dysenteriae
B madampensis (Castellanus madampensis)	O or A	AC	+	Differs serologically from <i>B ceylonensis</i> - B
B morganii (Proteus morganii)	O	O	+	
B paratyphosus - A (Salmonella paratyphosa)	O or As	A	O	The strain <i>sendaensis</i> is isolated to titre by <i>S paratyphosus</i>
B paratyphosus - B (Salmonella Schottmuelleri)	O	O A Alk	O	Certain strains serologically identical at times only A instance strains do not ferment inositol
B coli (Common type) Escherichia coli var communis	A O	AC	+	B coli (<i>Escherichia coli</i>) has many different serotypes like bacteria All characterized by fermenting lactose and clotting milk
B coli (Common type) (Escherichia coli var communis)	A O	AC	+	Some authors use the term <i>indole</i> to indicate those which gas ferment and <i>coliform</i> to indicate those which gas ferment that sugar

Bacillus ceylonensis A (Cast 1907) (*Bacterium sonnei* Levine *Castellanus krusecastellani*/Cerruti *Shigella sonnei* Weidm) Non motile non liquefying organism originally isolated in Ceylon from cases of chronic pyrexial colitis Does not produce gas in any sugar Produces acidity in glucose and after repeated transplantation in several other sugars Produces acidity in lactose very slowly and milk is clotted very slowly Indol negative Cerruti (1930) showed that *B sonnei* is identical with it The original strain is still available

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Bacillus madampensis (Cast 1911) (*Shigella madampensis* *Castellanus madampensis*) Indol positive Not agglutinated by *ceylonensis A* and *ceylonensis B* sera

To denote the group *Bacillus ceylonensis B* *B ceylonensis B* and *B madampensis* I introduced years ago as a convenient collective term the term metadysenteric bacilli Cerruti in 1930 created for this group the genus *Castellanus* differing from the genus *Shigella* in acidifying lactose and clotting milk The three species *ceylonensis A* *ceylonensis B* and *madampensis* can in practice be easily differentiated as follows *ceylonensis A* does not acidify dulcitol does not produce indol *ceylonensis B* acidifies dulcitol produces indol *madampensis* does not acidify dulcitol produces indol They can also be identified by serological methods as there is no cross agglutination among these organisms

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Table showing *B. Ceylonensis* A (*Shigella sonnei* Castellanus *krusecastellani*)
B. Ceylonensis typhosa A) *B. Paratyphosa* B (*Salmonella paratyphosa* B) *B. coli*
 like bacterium

Org name	Gly	Lys Mk	Ind	Remarks
<i>B. columbensis</i> (Morganella Salmonella Proteus Escherichia Enteroides columbensis)	AG	O	+	Differs from the paratyphoid bacilli (A B and C) in gas fermenting glycerol salicin and in often producing indol Differs serologically from those organisms and other salmonellae Differs from <i>B. assauica</i> in not gas fermenting saccharose and serologically Differs from <i>B. morganii</i> in gas fermenting maltose and serologically Occasion-ally will produce suddenly acid and gas in lactose peptone water while milk is not clot-ted and remains alkaline
<i>B. asiaticus</i> (Salmonella assauica)	AG	A or Alk	S or O	
<i>B. faecalis</i> (Proteus faecalis)	Alk or O	Alk	O	All typical strains produce strong alkalinity some strains peptonize milk Some strains have different sugar reactions A Variety <i>matad flae s</i> produces no gas fer-mentation of any sugar
<i>B. proteus</i> (Proteus proteus)	O or As	C or P	+	Some strains on first isolation produce acid in glucose and the acidification of lactose may be absent or extremely slow <i>Sonne s bacillus</i> and <i>Kuse s pse do dysentery E</i> have been shown to be identical with it
<i>B. ceylonensis</i> — A (Cas-tellanus sonnei/kruse-castellani)	A or O	AC (v slowly)	O	Differs serologically from <i>ceylonensis</i> — A <i>n dampensis</i> and all other dysentery organisms Differs serologically from <i>B. ceylonensis</i> — A <i>e B ceylonensis</i> — B
<i>B. ceylonensis</i> — B (Cas-tellanus ceylonensis)	A	AC	+	
<i>B. madampensis</i> (Castella-nus madampensis)	O or A	AC	+	
<i>B. morganii</i> (Proteus mor-gani)	O	O	+	
<i>B. paratyphosa</i> — A (Sal-monella paratyphosa)	O or As	A	O	The strain <i>sensuensis</i> isolated in Tapan does not gas ferment any sugar although agglutina-ted to titre by <i>S. paratyphosa</i> — A serum Certain strains serologically typical will pro-duce B times only A instead of AG some strains do not ferment inositol (Weiss n Rice) <i>B. coli</i> (<i>Escherichia coli</i>) is a term applied to many different asporigenous intestinal rod like bacteria all characterized by gas ferment-ing lactose and clotting milk Some authors use the term colicomunior to indicate those which gas ferment saccharose and colicomunis to indicate those which do not gas ferment that sugar
<i>B. paratyphosa</i> — B (Sal-monella Schottmuelleri)	O	O A Alk	O	
<i>B. coli</i> (Communis type) <i>Escherichia coli</i> var <i>communis</i>	AG	AC	+	
<i>B. coli</i> (Communior type) (<i>Escherichia coli</i> var <i>communior</i>)	AG	AC	+	

□ = Negative reproduction of indol □ = negative

Bacillus ceylonensis A (Cast 1st krusecastellani/Cerruti *Shigella sonnei* originally isolated in Ceylon from produce gas in any sugar Produces ac tation in several other sugars Produces a clotted very slowly Indol negative identical with it The original strain is

Bacillus ceylonensis B (Cast 190 tellanu Cerruti) Produces no gas in several other sugars including lactose *sonnei* A serum and *madampensis* serum

Bacillus madampensis (Cast 1911) *sonnei*) Indol positive Not agglutinate

To denote the group *Bacillus ceylonensis* I introduced years ago as a con tery bacilli Cerruti in 1930 created for from the genus *Shigella* in acidifying *ceylonensis* A *ceylonensis* B and *madampensis* as follows *ceylonensis* A does not *ceylonensis* B acidifies dulcitol produce citol produces indol They can also be is no cross agglutination among these

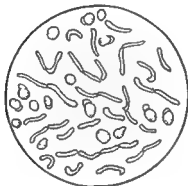
3 INTERN

Diseases of the

STOMATITIS CRYPT

This stomatitis was described (Diseases of Central America Hygiene Vol xxviii : 1925) appearance from ordinary thrust somewhat diffuse are scarcely They have the appearance of a t parts of the oral mucosa occasional patches of incipient leukoplakia

scrapings will enable a differential diagnosis to be made. The first two cases of this stomatitis I observed in Central America later I saw a case of the same or a very similar type in Europe. The condition seems to be due to a very delicate yeast like fungus which I called *Cryptococcus graciloides* (= *Pityrosporum graciloides*) living in symbiosis with a bacillus *B. vermiculoides* which I first described in 1925. A detailed account of these two organisms is



Symbiosis *Cryptococcus graciloides* — *Bacillus vermiculoides*

found in the *Journal of Tropical Medicine and Hygiene* Vol. XXVIII 217 1925

«CAT TONGUE GLOSSITIS

(«Langue de Chat» Glossitis)

The patient complains of discomfort and pain in the tongue and there may be salivation. The tongue is brick red and the dorsum shows a peculiar granular appearance somewhat resembling what the French authors call «langue de chat». No patches of thrush appear but there is little doubt that the condition is mycotic. In deep scrapings both microscopically and culturally numerous candidae are found usually *Candida albicans* and *C. tropicalis*. The treatment consists in carbolic acid mouth washes ($\frac{1}{2}$ %) and in giving potassium iodide by mouth.

STOMATITIS MEMBRANACEA MALIGNA

(Malignant Membranous Stomatitis)

This condition has been observed by me in the Balkans and in Louisiana. As far as I know there is no literature on the subject the condition generally being confused with Plaut Vincent's stomatitis or with thrush. I have described it in some old publications among which «Minor Tropical Diseases» (Transactions Royal Society of Tropical Medicine Vol 24 p 394 1930) and in my recent Manual of the Diseases of Africa (Rome 1947). The disease at present seems to have practically disappeared from Louisiana.

Clinical Symptoms — In a typical case the patient in Louisiana very often a coloured young or middle aged woman shows on the oral mucosa especially the dorsum of the tongue some large white membranes or more correctly pseudomembranes which in many cases can be easily stripped off when the surface of the mucosa will appear raw and inflamed without however true ulcerative lesions. The membrane is white quite thick and after stripping often reforms. The condition is painful and there is frequently fever usually of a low intermittent type but at times the condition becomes grave and in certain cases extremely so the patient looks and feels very ill the pulse is weak and rapid of low pressure at times there may be high fever. The examination of the chest and abdomen does not reveal any condition which can explain the gravity of the case the usual blood tests (Wassermann agglutination tests for enterica etc) are negative. The blood picture varies in certain cases there is a polymorphonuclear leucocytosis but it is not constant the hæmoglobin and number of red blood cells may be decreased. A certain number of cases terminate fatally and the post mortem findings with the exception of the oral mucosa are negative. In a case in New Orleans in 1928 during the last few days of life pneumonia developed and the post mortem findings showed merely the usual features of lobar pneumonia.

Diagnosis and Etiology — The condition must be differentiated from Plaut Vincent's stomatitis as the gums are not affected and the

membranes are much thicker and are fairly easily stripped off. Moreover in the incipient stage no spirochaetes and fusiform bacilli are found though later both these organisms may in a few cases be present but only in very scanty amount they are always mixed with many other organisms and are certainly secondary invaders. In several cases a peculiar coccus is present which while fermenting glucose has practically no fermentative action on levulose (*M. laevulosinertis* Cast 1928) but in my opinion no aetiological importance may be given to it. The condition has nothing to do with thrush as the white membrane is not composed of candida fungi but apparently chiefly of fibrin no mycetes being present. Is it a manifestation of pellagra? In none of the cases I have seen was there any sign of pellagra such as the typical dermatitis or hyper pigmentation or nerve symptoms and I must add that all the cases I have seen in Louisiana had been diagnosed by the local medical men as Plaut Vincent's angina or malignant thrush and none of them had suggested pellagra although they knew pellagra well this disease being quite common in the Southern States. In pellagra there is of course very often a glossitis but this is generally Sandwith's bald tongue — clean red and smooth sometimes with small ulcers near the tip. We must therefore come to the conclusion that the aetiology of this disease is unknown although I cannot help thinking that further investigation may possibly reveal the condition to be in some way associated with pellagra or at any rate to be a deficiency disease.

Treatment — This is unsatisfactory. On the assumption that it might be a manifestation of pellagra or at any rate a condition related to pellagra I tried a diet rich in animal protein and injections of liver extract (nicotinic acid was not yet known) but I was unable to convince myself that it did much good. If the patient has no idiocyncrasy for milk this is probably the best food and will not irritate the mouth. At present nicotinic acid and riboflavin should be tried. Locally mild mouth washes should be used for instance carbolic acid (1/200). A mouth wash which at times is useful is the following: Glycer boracis grm 20 Glycer ac carbolic grm 20 Aq rosae ad grm 180. One teaspoonful in a large tumbler of tepid water. If there is much pain 30 centigrams of cocaine hydrochlorate or stovaine may be added to the prescription. Applying a methylene blue paint (Medicinal

methylene blue gram 0.20 Aq dest grm 30) to the lesions ■
occasionally useful

LEUKOKERATOSIS LINGUALIS HYPERTROPHICA

In the tropics I have seen three cases of a peculiar hypertroph ■
leukokeratosis of the tongue of obscure origin syphilis yaws over



Case of Leukokeratosis Lingualis Hypertrophica in a woman

smoking being excluded with certainty In none of the cases epithe
lioma developed Four years ago I saw ■ similar case in Portugal
Although Wassermann was negative an antisiphilic treatment was
given without any result A distinct improvement was obtained by

using locally a strong solution of resorcin. So far in this case also no epitheliomatous changes have taken place.

ULCUS ORIS PERSTANS

This rare condition has been observed by me in patients of Caucasian race and in a negro in New Orleans and later in a white officer returning from Ethiopia and another white officer in 1946 who had contracted the disease in Libya.

Etiology — This is unknown.

Symptomatology — On the oral mucosa corresponding to the region of the cheek one or two or three fairly large roundish or oval rather shallow ulcers are seen which persist for years and do not respond to any treatment. The ulcers which may have a diameter of 1 to 3 cms — present a red fundus smooth and at times slightly granulating. The margins are not undermined. The ulcers are never painful and not very tender. In one of the cases the submaxillary lymphatic glands were slightly enlarged but not painful on pressure.

Diagnosis — The diagnosis is based on the presence of one or more ulcers on the oral mucosa which persist for years having no tendency to spontaneous amelioration and not answering to any treatment including arsphenamine, mercury, potassium iodide and also sulphonamides and penicillin which were tried in the last case. Scrapings are negative for *T. B.* spirochaetes, leishmania and fungi. Inoculations of the scrapings into guinea pigs negative. The Wassermann test negative. The condition must be differentiated from relapsing ulcerative stomatitis. In the latter condition the ulcers are more than one, two or three, much smaller and heal within a few weeks or months and they are painful. Not rarely crops of aphthae looking superficial small ulcers appear on the genital organs from time to time.

Prognosis — The general health does not seem to be much affected but the ulcers do not heal for years.

Treatment — Most unsatisfactory. Keep the ulcers clean by using diluted hydrogen peroxide. A 1/2 or 1 per cent methylene blue paint may be applied. Castellani's fuchsin paint may be used. The ulcers may be touched occasionally with 1 or 2 per cent silver nitrate solution or argyrol or colloidal argentum. A mouth wash containing 1/2 per cent carbolic acid may be used.

BROWN THRUSH

(*Stomatitis mycetica fusca*)

This condition is rare. It may be found alone or in association with tonsillomycosis fusca. It is characterized by the presence of one or several patches about 1/3 to 1 cm. on the oral mucosa, usually somewhat raised, brownish or yellowish brown or dark brown in colour or occasionally of a dirty whitish colour. The condition has very little tendency to spontaneous cure and may last for many months and even years.

Scrapings show the presence of filamentous fungi quite different from those found in ordinary white thrush, as there are no free budding globular or ovoid cells consisting solely or almost solely of mycelial threads. They belong to the genus *Geotrichum*. The commonest species is *Geotrichum rugosum* Cast. (synonyms *Trichosporum rugosum*, *Hemispora rugosa*, *Monilia rugosa*, *Oidium rugosum*).

LEPTOTHRIX THRUSH

(*Leptothrix Stomatitis*)

Accumulations of *leptothrix*, *vibriothrix* and other thin filamentous fungi, some of them found in normal mouths, may produce small whitish spots on the oral mucosa, but the condition is extremely rare. The treatment consists in applying tincture of iodine or Castellani fuchsin paint.

STOMATITIS ERYTHEMATOSA GUTTATA PRURIGINOSA

Castellani has observed several cases of a peculiar condition characterized by the presence of circular or oval erythematous patches

of various sizes principally on the mucosa of the hard palate. These circular patches remain for three or four days, seldom for more than a week, and then disappear without any exudate or ulceration forming. The patient complains of itching in the patches or in the mouth, but not on the body; there is no pain, no tenderness. The general health may be excellent, or the patient may complain of feeling «liverish». Blood normal, no eosinophilia. The examination of the urine and stool shows nothing abnormal. The patches disappear spontaneously within a week, but a mouth wash containing glycerine of alum and glycerine of carbolic acid is useful. The condition is found at times in subjects with hypertrophic tonsils.

The affection may be a form of localized urticaria, but no sign of urticaria is ever found in the body, and there is no tendency to dermatographia.

If the itching is very severe, luminal may be given internally, 1/4 grain four times daily. In one of our cases the only drug that stopped the pruritus was heroin by the mouth, 1/6 grain four times daily.

«DOEDERLEIN BACILLUS STOMATITIS

We have seen two cases of acute, diffuse, painful, catarrhal stomatitis developing in two men addicted to cunnilingus. A gram-positive bacillus was present in enormous numbers on the surface of the tongue and in the saliva, indistinguishable from Doederlein's organism (*Bacillus vaginalis*, *B. crassus*), which is normally found in the vagina and is considered to be non-pathogenic.

BIGIO

Synonyms — Habeb, Somaliland; Falciform ulcer of the lips.

This condition is fairly common in Somaliland and other parts of East Africa. It has been known to the natives of Somalia for many years. They refer to the condition as «bigio» and to the sufferer as «bigiole». In some districts of Somalia they call it habeb. A good description of it was given by Robert Fiers in 1929. He was inclined

to identify it with an affection of the lips described by H Gros in Algeria in 1909 but Gros described in reality a gingivitis with no lesions on the lips as can be found in his original paper published in the Bulletin de la Societe de Pathologie Exotique 1909 p 282



Case of Bigio

In typical case, the mucosa of the lower lip from commissure to commissure is superficially ulcerated the whole ulcerated area having a falseform appearance The ulcerative process affects the mucosa and vermillion part without spreading to the skin

The surface shows a slight serous exsudation which may dry up in a yellowish thin crust Depigmentation is noted There is no pruritus and no pain The course is extremely chronic in some cases the disease lasting ten to twenty years When it heals a certain

amount of fibrosis — left and depigmentation The aetiology is unknown It has been suggested that it may be a form of avitaminosis The treatment is rather unsatisfactory The natives praise a paste consisting of antimony and goats liver which they call «kohoh» Cicchito strongly recommends the local application of Castellani's fuchsin paint

ENDEMIC PAROTID ENLARGEMENT

(Endemic hype pl s a of the parotid)

Synonym — Mangy (Madagascar)

Remarks — The condition is common in Egypt and other countries situated in the tropical and subtropical zones but may occur also in the Temperate Zone Attention was first called to it in Egypt by Sandwith in 1905 He believed it to be due at least in some cases to obstruction of Stensen's duct It was later observed by Day Biggam Chalhounqui and others in the same country It has been noted by Fontoyne in Madagascar where it is known by the natives as «mangy» It has been observed also in the Dutch Indies by K de Jonge especially in association with beri beri An excellent paper on the subject is by Kenawy

Etiology — The aetiology is unknown An avitaminic origin has been suspected as a type of this condition is common in pellagra Microbic and virus theories have been brought forward As the condition has been found at times in case of diabetes it has been suggested that the parotid enlargement may be of a compensatory nature to counteract the diminution in the functions of the pancreas Flaum believing that the parotid glands have an internal secretion increasing sugar tolerance

A few observers have considered the condition to be a mild type of Mikulicz's disease

Predisposing Causes — The condition may be found in people of all ages from ten to sixty five years and over It is much more common in men than in women Pellagra beri beri diabetes and

ancylostomiasis are considered to be predisposing causes by some observers

Pathology — The gland is much larger than normal and about two to four times as heavy. Histologically there is an increase in the number of the ducts and ductules some of which are ectatic. The acini are numerous. There is no sign of inflammation. In contrast to recurrent parotitis there is no proliferation of the duct epithelium.

Symptomatology — The parotid regions appear swollen but there is no inflammatory sign and no pain or tenderness. The condition may be bilateral or unilateral. It develops slowly without any apparent reason and the course is extremely prolonged; spontaneous involution being exceptional.

Saliva — No definite sialorrhoea is present or at any rate the patient never complains of hypersecretion of saliva. The reaction is often alkaline. The ptyaline content is not diminished. Potassium thiocyanate is constantly absent. Squamous epithelium cells in various numbers are found but only a few pus cells are present unless there is some gingivitis. Saliva obtained by catheterisation of Stensen's duct is alkaline; it does not show pus cells or only a few and no bacteria are present.

According to Kenawy the average total solid contents is about 0.57 gramme per cent and the calcium 6.9 milligrammes per cent while in normal Egyptians the total solids content is about 0.65 gramme per cent and the calcium 7.9 milligrammes per cent. The absence of potassium thiocyanate is not due to failure of its excretion by the salivary glands because when thiocyanate is administered it appears in the saliva in the normal range.

Sialography — Sialography carried out by injecting lipiodol in Stensen's duct shows nothing abnormal in about half of the cases but the large size of the gland is put in evidence. In a number of cases there is dilatation of the main duct or ductules. In some cases a leafless tree appearance is noted due to the multiplicity of the ducts. Stensen's duct is usually patent but occasionally may show some tortuosity due to fibrosis.

Diagnostic — This is based on the bilateral or unilateral persistent painless swelling of the parotid region without any sign of inflammation and with no tendency to spontaneous regression

Differential Diagnosis — Mumps runs an acute course with fever and complete disappearance of the swelling seven to ten days after the temperature has become normal. In recurrent parotitis there are periods when the glands are not enlarged. In Mikulicz's disease the lachrymal glands are also enlarged and the disfigurement is much more. Moreover the histological examination of a piece of the excised gland shows a diffused inflammation with lymphoid cells especially around the walls of the alveoli. In uveo parotid disease of Heerfordt there is unilateral or bilateral enlargement of the parotid glands with uveitis and facial paralysis.

The uveal lesions are usually in the form of iridocyclitis and the condition is of tubercular origin.

Prognosis — The general health is not affected but the condition is chronic and somewhat disfiguring. Spontaneous regression is exceptional; it has been noted occasionally after an attack of erysipelas.

Treatment — X ray therapy is most useful. It should be given in small dosage at weekly intervals. Five or six applications are generally sufficient.

RECURRENT PAROTITIS

We have seen a few cases of this condition in white children and young adults and also in children and young adults of various native races. From time to time the parotid regions swell and there may be some slight local discomfort. Fever is usually absent and the general condition of health is not much impaired. The condition may be unilateral or bilateral. Two principal aetiological types have been described: the bacterial type generally caused by streptococci of the viridans group and the allergic type which is often accompanied by urticaria, Quincke's oedema and asthma. A so called nervous recurrent enlargement of the parotids has been described in neurotic subjects.

MACROGLOSSIA MYCOTICA CANDIDIACA (MONILIACA)

This condition was observed by me in three cases in Ceylon during the period 1910 to 1915. In 1923 an interesting case of the same type was kindly sent to me in London by my friend Dr Broughton Alcock for investigation. Pereira Filho (1927) described a case in Brazil. Later other cases have been placed on record.

General remarks — The condition is not a form of blastomycosis as generally understood in North America and Great Britain, but an affection characterized by the presence of large framboesiform papillomatous nodules and plaques due to the same fungi which cause Gilchrist's disease. The condition is apparently caused by fungi of the genus *Candida* — the same fungi that cause thrush — which penetrate deeply into the tissues of the tongue causing inflammatory and hypertrophic changes of the whole or part of the organ. Usually the whole tongue is very greatly enlarged and occasionally painful; the patient feels discomfort in eating and may have some difficulty in speaking — he cannot whistle. On the surface of the tongue slightly elevated verrucoid patches may be noted in certain cases; in a few cases thick thrush membranes may be present. Deep scrapings should be made from the tongue after drying and painting with tincture of iodine and cultures made. The finding of yeast-like organisms in superficial scrapings of the tongue has no importance as these fungi are frequently found in that situation even in normal mouths. Potassium iodide has a very beneficial effect on the condition and vaccines prepared with fungus also seem to be useful in desensitizing the patient.

Etiology — In the Ceylon cases I found candidae of the types *tropicalis* and *albicans* var. *pinoyi*. In the London case I found a candida with the following characters: does not produce gas in any sugar; occasionally produces slight acidity in glucose; there is no change in litmus milk. As this candida produces no gas in any sugar it belongs to the group *zeylanica zeylanoides*; it differs from the former by not producing any yellowish pigment. I called it *Monilia*.

macroglossiae at present known as *Candida macroglossiae*. It may be merely a variety of *C. eylandoides*.

Pereira Filho isolated a candida with the following characters from his case in Brazil: does not liquefy gelatine or serum, does not clot milk, produces acidity and gas in glucose, levulose and maltose, produces acidity only in saccharose and galactose, it does not touch lactose, mannitol, dextrin or arabinose. Pereira Filho (1927) made a new species of the candida he observed and did me the honour of calling it *Monilia aldoi*. It seems to be a variety or strain of *Candida albicans*.

BACTERIAL FOETOR ORIS

In my experience foetor oris (halitosis) is quite common in the tropics, possibly more common than in the temperate zone. As is well known, it is due to a variety of causes, the principal ones being decaying teeth, gastro-intestinal disturbances and certain chronic broncho and broncho-pulmonary conditions (bronchiectasis and gangrene of the lung).

A type of foetor oris which I have studied and which seems to be quite common is due to the presence of certain evil-smell-producing bacilli in the fauces and on the surface and in the cryptae of the tonsils. Of these bacilli I have isolated two principal types: one with the biochemical characters of a coli-like organism (*Escherichia coli foetida* Cast.) and the other with the biochemical characters of an alkaligenes-like organism (*Alcaligenes alkalifoetidus* Cast.). They are both Gram-negative and motile bacteria, and their biochemical characters were described by me in 1930 (Foetor oris of tonsillar origin and certain bacilli causing it, *Lancet* : 623).

In some cases of foetor oris of tonsillar origin, evident lesions of the tonsils are present, such as white grains in the cryptae (tonsillar granulomycosis). If the white grains are extracted and squashed, the most offensive odour due to the presence of the bacillus is often emitted. I have frequently found the bacilli present together with a number of other organisms, such as cocci, actinomyces, candidae, spirochaetes, fusiform bacilli, and in exceptional cases even amoebae and flagellates. None of these, however, seem to be the cause of the bad odour. In some cases the white granules are odourless, and the

bacilli I have described are absent. In some cases no gross lesions are present the tonsils being merely enlarged at times apparently quite normal. Swabs taken from the tonsils and fauces however reveal the presence of one or the other type of the bacilli described above. With regard to treatment when gross lesions are present enucleation is the best therapeutic measure when no gross lesions are present a vaccine treatment may be tried as well as local applications of various disinfecting paints the best apparently being the fuchsin paint that goes by my name. There is no danger whatever in the patient swallowing a bit of it with the saliva but the urine may become slightly pinkish or reddish.

It is interesting to note that the original strains of *Bacillus colofotidus* isolated in 1928 and 1929 and since then subcultured hundreds of times still present the same biochemical characters and still produce a very offensive odour in peptone water and broth (See Castellani A and De Silva R Journ Trop Med & Hyg December 1951)

TONSILLOMYCOSES

Tonsillomycoses *viz.* diseases of the tonsils due to fungi are comparatively speaking quite common in the tropics and several times I have been called in to see cases which had been diagnosed as diphtheria. I have given a general account of tonsillomycoses in many publications including my recent book on Diseases of Africa (Rome 1947) and will therefore limit myself to mentioning here only a few which are of practical importance to the newly arrived medical man in the tropics.

Tonsillomycoses may be classified in different ways a purely aetiological classification may be adopted or a histopathological classification or a clinical classification. As the same clinical syndrome may be caused by a large number of different fungi it is probable that from a practical point of view a clinical classification is the best.

The following is the classification I have suggested

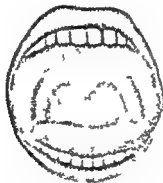
1 — *Acute tonsillomycoses* Tonsillomycosis follicularis tonsillomycosis diphtheria similis vel membranacea

- 2 — *Chronic tonsillomycoses* (1) *tonsillogranuloactinomycosis*
 (2) *tonsilloagranuloactinomycosis* (3) *tonsillomycosis spinuolosa*
 (4) *tonsillomycosis fusca*

FOLLICULAR TONSILLOMYCOSIS

(*Tonsillomycosis follicularis* *tonsilloblastomycosis follicularis* *pro-pa-te*
tonsilloblastomycosis follicularis *pro-pa-te* *tonillomycosis pro-pa-te*
tonsilloblastomycosis pro-pa-te)

Etiology — In the enormous majority of cases the condition is due to yeast like fungi of the genus *Candida* (*tonsillocandidiasis*



Tonsillomycosis follicularis

vel moniliasis) the ordinary causative agents of thrush and in reality the condition is a variety of thrush in some cases to yeast like fungi of the *Cryptococcus* *vel Torulopsis* type and in a few cases to fungi of the genus *Saccharomyces* occasionally to fungi of the genus *Debaryomyces* of the genus *Willa* of the genus *Geotrichum* Fungi of the genera *Actinomyces* and *Vibrithrix* have at times been found

Symptomatology — On the surface of the tonsils several white or whitish grey or whitish yellow spots are seen corresponding to the openings of the follicles. The patient complains of a sore throat and

discomfort in swallowing there may be fever but the general condition seldom becomes serious and the affection usually heals spontaneously within one to three weeks. Occasionally the mycotic infection spreads to the uvula and soft palate forming diffuse white patches and then becomes indistinguishable from the diphtheria like type of tonsillomycosis. In other cases the mycotic infection spreads from the tonsils all over the oral mucosa. An interesting case of this type has been described by Muggia.

Diagnosis — This is based on the microscopical and cultural examination of the patches. Usually a large number of yeast like cells are found while streptococci and other cocci and spirochaetes are absent or present in very small numbers only. In a few cases when the condition is caused by the genus *Geotrichum* mycelial filaments are abundant while budding cells are absent. Prognosis is usually favourable.

Treatment — At times the local application of glycerine of borax or of a solution of carbolic acid 1:20 is sufficient in many cases. Diluted tincture of iodine (1:20-1:40) is useful. Internally salicylates, aspirin, phenazon, pyramidon may be given. In the cases which do not clear up quickly potassium iodide should be administered or collosol iodine or salidine. Recent experience has shown me that the simple application twice daily to the throat of my fuchsin paint is usually the simplest and best treatment.

TONSILLOMYCOSIS DIPHTHERIA SIMILIS

(Tonsillomycosis membranacea)

Etiology — The disease is usually caused by yeast like fungi of the genus *Candida*. The species found are in most cases of the *albicans* type and *tropicalis* type. In a few cases fungi of the genera *Debaryomyces*, *Willia* and *Saccharomyces* are present.

Symptomatology — The onset is often sudden with a severe sore throat and difficulty in swallowing. The patient feels very ill and complains of great prostration. He sometimes has rheumatoid pains

in the joints fever is present and may be fairly high (102 to 103 F). Some of the cervical glands may be swollen and tender. The inspection of the throat will show creamy white patches on the tonsils the uvula and occasionally the soft palate the patches often coalesce. Removal of these patches may in some cases leave a very slight ulcerative bleeding surface. If the membrane like structure is placed between two slides it often feels like putty and lacks the elasticity and resiliency of a diphtheria pseudomembrane. It should be kept



Tonsillomycosis diphtheria similis

in mind that practically in every case in addition to the fungi streptococci are present and may play a role in the aetiology of the condition.

ILLUSTRATIVE CASES

C e () O 5th August 1971 Pensioner N (Ministry of Pensions Hospital O p gton) developed tonsillitis with temperature 102 F rapid pulse rate and prostration. The inspection of the throat showed white membrane on the tonsils and uvulae. It was easily detached but readily reformd. Neither in the direct smear nor by culture method were diphtheria bacilli found. In the direct smear made at the bedside a large number of *Candida* cells were found. From cultures on Löffler's medium and glucose agar a *Candida* was grown at 37 C and isolated in pure culture. The patient made a good recovery after using a chlorine gargle.

Case (n) A Singhalese girl aged about 11 years was admitted to the Infectious Diseases Hospital in Colombo in 1910 with the diagnosis of diphtheria. There were white patches on the tonsils, uvula and soft palate. The temperature was rather high (102°F) the pulse rate was fast and of low pressure. There was some swelling at the angle of the jaw. The child developed symptoms of broncho-pneumonia and died three days after admission. Anti diphtheria serum was given twice by the physician in charge of the hospital. The microscopical and bacteriological examination of the patches for the *Corynebacterium diphtheriae* carried out with the usual technique of those days (Löffler's serum etc.) remained negative. Rod like bacteria were not seen in the specimens taken directly from the patches but numerous mycelial and conidial elements of a fungus were present. On serum and glycerine agar media colonies of diphtheria were not found. The fungus had all the biochemical characters of *Monilia tropicalis* Cast. (= *Candida tropicalis*).

Prognosis — The prognosis is generally favourable but not invariably so. In the case in Ceylon which I have quoted above the fungal infection spread to the bronchi and lungs and a severe mycotic broncho pneumonia developed which ended fatally.

Diagnosis — This is based on the microscopical and cultural examination of the white patches which will reveal a large number of fungal elements generally in the form of budding yeast like bodies. The condition is differentiated from diphtheria by the presence of the fungus and the absence of the diphtheria bacillus (*Coryn diphtheriae*). It must be kept in mind however that cases of mixed infection diphtheria plus mycosis are occasionally met with. The condition must also be differentiated from Plaut Vincent's angina in tonsillomycosis spirochaetes are absent or extremely rare. Moreover in Plaut Vincent angina the membrane is usually of a dirty greyish colour rather than creamy white and if removed an ulcer will be seen frequently fairly deep. In mycosis the removal of the mycotic membrane will ordinarily show only very superficial lesions.

Treatment — Diluted tincture of iodine should be applied to the patches and a carbolic spray (1 per cent) may be used. Potassium iodide may be given internally. Recent experience seems to show that the simplest treatment is by applying Castellani's red paint. Even if swallowed there is no danger of poisoning although the urine may become occasionally reddish.

TONSILLOMYCOSIS SPINULOSA

(Tonsillomycosis spiculata tonsilloidomycosis pro parte)

Etiology — The microscopical and cultural examination of the spicules shows that they consist of fungi usually of the genus *Geotrichum*. In several cases I have found *Geotrichum rotundatum* and *Geotrichum asteroides*.

Symptomatology — On inspection of the tonsils numerous grey or greyish brown or whitish or pure white erect spicules sometimes



Tonsillomycosis spinulosa Semischematic drawing
The spicules have been magnified

in bundles several millimetres in length are seen usually originating in the crypts. The condition which is not a common one runs a very chronic course. The patient may complain of slight sore throat but the symptoms are seldom acute.

Diagnosis — This is based on the microscopical and cultural investigation of the spicules.

Treatment — The treatment consists of applying locally diluted tincture of iodine potassium iodide may be given internally. The fuchsin paint seems to give good results.

TONSILLOMYCOSIS FUSCA

On one of the tonsils occasionally somewhere else on the oral mucosa a rather large brownish or dirty greenish patch about $\frac{1}{2}$ cm or more in diameter is seen which cannot be removed easily. When forcibly removed a superficial ulcerated lesion remains. The patch is composed of an enormous number of mycelial filaments of fungi of the genus *Geotrichum* e. g. *G. rotundatum*, *G. rugosum* (*Hemispora rugosa*). The treatment is most difficult and may take many months to obtain a cure. Tinct. iodi and the fuchsin paint are on the whole the best local applications.

«TEA TASTER'S COUGH»

When I was in Ceylon a young assistant in one of the big Colombo firms a tea taster came to consult me about a chronic cough which he said had not yielded to ordinary treatment and had been suspected by several medical men to be of tuberculous origin. He emphatically stated however that he did not believe the condition was tuberculosis. «I am merely suffering» he said «from tea taster's cough» an expression I had never heard before. The general condition of the patient was good and physical examination of the chest revealed only a few coarse rales. The microscopic examination of the sputum was negative for tuberculosis; instead I noticed microscopically some mycelial filaments and some yeast like bodies. I inoculated several dextrose agar tubes and grew a monilia (*Candida*) fungus which at the time I believed to be an endomyces.

How did this patient become infected? Tea tasters in order to judge of the various qualities of the teas not only taste infusions but also often fill their hands with the tea leaves and bury their noses in them sniffing them up. In this way a certain amount of tea dust enters the nasal cavities.

Now if one examines tea dust in Ceylon one finds it contains fungi of the genus *Candida* constantly of the genera *Aspergillus* and *Penicillium* frequently and of the genus *Geotrichum* occasionally. A peculiar streptococcus is also often present. The same organisms

are not rarely found in the nasal cavities of tea tasters and when bronchial symptoms appear in them *Candida* fungi are present in the expectoration. It is probable therefore that so called tea taster's cough is a candidiasis (moniliasis) especially since a guineapig in the nostrils of which I insufflated tea dust regularly for months died with symptoms of chronic broncho pneumonia.

What I have said about «tea taster's cough» applies to a great extent to the so called «tea factory cough». For many years planters in Ceylon have noted that the coolies doing work in tea factories where the leaves are dried and there is a large amount of tea dust floating about after some months become weak, lose flesh and often have a cough with mucopurulent expectoration. The planters have found by experience that the coolies must be taken away from the factory and sent to work in the field then the symptoms slowly disappear. I have examined some of the coolies and their expectoration practically always contained fungi of the genus *Candida*. I have little doubt therefore that the so called «tea factory cough» is a bronchomycosis and probably a bronchomoniliasis (bronchocandidiasis).

BRONCHO SPIROCHAETOSIS

This disease was described by me long ago in Ceylon in local publications and also in the *Lancet* (Note on a Peculiar Form of Haemoptysis with Presence of Numerous Spirochaetes in the Expectoration *Lancet* 1906 May 19 p 1384) and the *British Medical Journal* (Broncho Spirochaetosis September 18 1909). An account of it may be found in Castellani & Chalmers *Manual of Tropical Medicine* (London 1919) and in my *Manual of African Diseases* (Rome 1947). It has been thoroughly investigated in Italy by Cannavo Iacono and others in France by Violle and in Switzerland by Galli Valerio. The patient has a chronic cough and from time to time brings up sputum tinged with blood. The general condition of health however is usually fairly good but the patient worries a great deal as very often tuberculosis is suspected by the medical attendant. The diagnosis is based on the absence of *Mycobacterium tuberculosis* and fungi and the presence of *Spirochaeta bronchialis* Cast. a polymorphic organism which differs from the usual spirochaetes of the

mouth type Vincent etc in becoming dissolved or transformed into numerous small granules a few minutes after expectoration while the ordinary buccal spirochaetes of type Vincent etc remain unchanged for hours in the sputum Arsenic tartar emetic potassium iodide and penicillin are useful It is interesting to note that this disease which was very prevalent after the First World War is now rarely met with An excellent very complete monograph on it was published by Cannavo (Letterio Cannavo *La Broncospirochetosi* di Castellani Casa Editrice Salpietra Palermo 1937)

TROPICAL ABDOMEN

(Tropical Colon «Tropical Tummy»)

(Little known tropical intestinal dyspepsias and diarrhoeas)

It may be said with truth that in many tropical countries a large number of European residents particularly old residents seldom feel to use a popular expression «quite right inside» In most cases there are no symptoms pointing to any definite intestinal illness there is merely a most constant feeling of slight abdominal discomfort not amounting to real pain and there is the consciousness that the slightest indiscretion with regard to food and drink will bring about an attack of severe abdominal trouble In many cases the stools are not formed in some cases there is constipation This condition is in some cases a sequelae of a definite intestinal disease such as dysentery either amoebic or bacillary In some instances it is the manifestation of an intestinal infection which is dormant or semi dormant especially with organisms of the metadysentery group

I should like to call attention to the desirability of investigating forms of vague intestinal conditions which are known by local names and about which very little is known I may mention as an example «Gypsy tummy» Anybody who has been in Egypt knows the term which of course like every other popular term is applied to many different conditions but principally to the type of intestinal dyspepsia with abdominal discomfort and occasional attacks of diarrhoea which are seldom if ever dysenteric

During the period 1930-1940 in London five patients came to consult me after a prolonged residence in Egypt suffering from what they called «Gypsy tummys». The bacteriological examinations proved them to be suffering from the colitis I have described in a series of publications as due to bacilli of the metadysentery group (viz. *ceylonensis* A = *sonnei*, *ceylonensis* B, *madampensis*). I have found the same infection in a patient who came from the northern mountainous regions of India and who told me he was suffering from «Himalaya trots».

MOTOR BICYCLE RIDER'S ABDOMEN

A description of this condition was given by me in my book *Malattie dell'Africa* Rome 1947. In Africa especially in Ethiopia and as a matter of fact also in Europe and America I have noticed in men who have to ride a motor bicycle for hundreds of miles such as road policemen — the following symptoms. The patient is in good general health but complains of abdominal discomfort after a long ride. The physical examination reveals nothing abnormal and liver and spleen are not dropped. In one case I found a floating kidney. The X-ray examination revealed however in many cases a colon which had a much lower position than normal.

If the patient is kept at rest for two or three days the abdominal discomfort disappears and the patient may have no further trouble. In some cases however the discomfort starts again as soon as the patient resumes his work and may get worse and worse with severe pain and in these cases the patient must be given another job.

Somewhat similar symptoms are found at times in tank troops. The wearing of an elastic «sport belt» is useful.

POLYPHLEBITIS TROPICALIS

This condition described by me long ago in several papers among which one on «Minor Tropical Diseases» (Trans. Royal Society of Tropical Medicine Vol. 24, p. 394, 1930) begins with one or several of the superficial veins of the legs or arms becoming

turgid very hard but not knotty and painful reddish sinuous lines may be occasionally seen on the skin diffuse redness is usually absent After two or three days a perivascular oedematous condition may develop and the veins are no longer visible or palpable There may be some temperature but this as a rule is not very high The lymphatic glands are not enlarged or painful Within a few days or possibly several weeks all the symptoms disappear but after a variable period of time another vein — or several other veins — are affected becoming very hard and swollen and oedema of the region may develop The

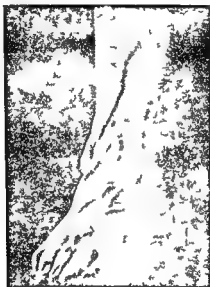


Polyphlebitis tropicalis

oedema is somewhat localized and seems to be due to periphlebitic inflammation The attack will soon disappear but after a few days weeks or even months yet another vein becomes affected or several veins become affected and so on for years Varicose veins never develop In some cases an ulcerative stage develops after several years the ulcers appearing on the feet in most cases An infiltrated red patch appears which slowly ulcerates the ulcer is shallow and takes a long time to heal In an old case the foot may show active ulcers ulcers in the process of healing and scar and hyperpigmented patches at one and the same time The ulcers are never deep I have known this condition to be mistaken for lupus of the extremities

ILLUSTRATIVE CASE

Mr E. A. T. R. during the First World War in Salonica had a somewhat peculiar fever which was variously diagnosed as malaria, relapsing fever, paratyphoid, etc. Soon afterwards a vein in the leg and one in the arm became swollen and painful; there was then apparently no fever. The attack disappeared within a few weeks but after four months other veins became affected. The second attack



Polyphlebitis tropicalis

had disappeared but a few months later again other veins became involved. In 1926 shallow superficial and very painful ulcers developed on the dorsum of both feet which on healing left hypertrophied scars and areas of hypertrophy. The patient consulted me in 1928 and I had him admitted into the Ross Hospital where he remained for some weeks. He was readmitted into the hospital in October of the same year and while in hospital had several attacks, one or several veins becoming affected, the veins becoming turgid, hard and painful, but not knotty, and usually a zone of oedematous infiltration developed around them; the region becomes swollen and the veins are no longer visible or palpable. The oedema seems to be due to a process of periphlebitis and not to thrombosis of the vein. Usually there

■ no fever previous to the attack or at the commencement or during the attack. The general condition of health is good no sign of varicose veins nothing abnormal with regard to the thoracic or abdominal organs urine normal microscopical blood examinations repeated many times both at night and during the day failed to reveal any parasites haemocultures negative Wassermann negative red cells 4 6000 000 hb 80 per cent colour index 1 white blood cells 6800 no abnormal cells or parasites polymorphonuclears 69 per cent large monocleues 2 per cent lymphocytes 27 per cent basophils 2 per cent

A case practically identical with this was described by Scotti in Libya in 1942. In his case however ulcerative lesions were not present. He wrote an excellent paper on it («*Poliflebite del Castellani*» *Riforma Medica* No 20 1941)

Etiology — The condition is not of filarial origin the blood examined at night and during the day being always negative for microfilariae. It is not of streptococcal origin. I have never been able to isolate any streptococci or any other germs from the blood of the general circulation. It is not of luetic origin Wassermann being always negative. In the open sores in the ulcerative stage various organisms may be found but none has proved to be aetiologically connected with the condition. In one case I found an actinomyces but I could not prove that it played any part in the aetiology of the condition. The disease is in no way connected with ordinary phlebitis and varicose veins and differs from the type of phlebitis described as «*Phlebitis migrans*» which is of syphilitic origin and characterized by the presence of multiple spindle shaped swellings about one inch in length which develop along the course of the vein.

Treatment — This is very unsatisfactory. Complete rest is essential. The salicylates and iodides seem to be useful and during the quiescent stage protein shock therapy occasionally appears to give fairly good results. Fibrolysin given by intramuscular injection seems to be useful. During the actual attacks local applications of diluted liquor plumbi and *tr. opii* are very soothing. The shallow ulcerative lesions found in the later stages on the foot are best treated at first with mild antiseptic lotions and later with ichthyol one drachm to the ounce of distilled water (4 grams to 30 grams of distilled water).

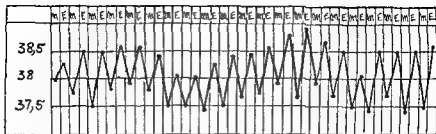
In a recent case sulphonamides and various antibiotics were administered. The most useful antibiotics appeared to be chloromycetin and aureomycin. A complete cure however was not achieved.

FEBRILE HEPATOSPLENOMEGALY OF ADULTS WITH ARTHRITIS

This rare disease was described by me in 1935 (Note on a Peculiar Febrile Hepatosplenomegaly with Arthritis Journ. of Trop. Med. & Hyg. Vol. xxxviii 229 1935). It was further investigated by myself and Girolami and a fairly complete paper by us on it appeared in the *Policlinico* (Sezione Pratica) Vol. XLIX 1947 and *Semaine des Hopiteaux* 26 April 1954 giving also the morbid anatomy and histopathology of the malady. I have also given a description of it in my *Manual of African Diseases* Rome 1947. The disease runs a chronic course (several years) and presents the following characteristic triad: fever usually intermittent and not very high; long afebrile periods; second hepatosplenomegaly; third arthritis. The fever may be absent for long periods. The liver is at first enlarged and then cirrhotic. The spleen is greatly enlarged and hard. In the last stage ascites may develop.

The origin is absolutely unknown; all the laboratory examinations for syphilis, kala-azar, undulant fever, etc. have been negative. The prognosis is very serious; all the cases I have studied having ended fatally with the exception of one who is still alive.

Diagnosis — The condition must be differentiated chiefly from Still's disease, known also as infantile arthritis with polyadenitis. Still's Disease affects only children. The spleen and liver are not much enlarged and the superficial lymphatic glands are hypertrophic. It may be interesting to quote part of the original Still description («On a Form of Chronic Joint Disease in Children» *Medico Chir. Society Transactions* Vol. LXXX 47-60 1897) «In nine out of eleven cases the spleen was enlarged the edge of the spleen being felt 1-2 fingers breadth below the costal margin. The liver was usually of normal size. The superficial lymphatic glands were markedly enlarged. The disease is not in itself fatal and the few deaths that were



Portion of the temperature chart of a case of hepatosplenomegaly with arthritis

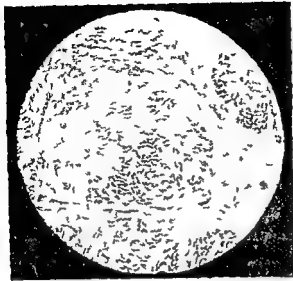
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Case of hepatosplenomegaly with arthritis X ray photograph of foot

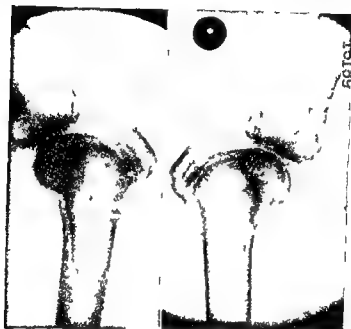


Case of hepatosplenomegaly with arthritis, pneumoperitoneum
Note greatly enlarged spleen and irregular outline of liver



Case of hepatosplenomegaly with arthritis
histological section of liver — Note fibrosis

recorded were due to complications. There can be little doubt therefore that the febrile hepatosplenomegaly with arthritis of adults described by me is a different pathological condition from Still's Disease



Case of hepatosplenomegaly with arthritis X ray photograph of knees

FAMINE DIARRHOEA

This condition has been observed in India during periods of famine and by me in the Balkans in Serbian and Montenegrin troops after the retreat through Albania (1st World War)

Actual starvation or bad greatly insufficient food lacking in protein fat and vitamins and extreme fatigue play a very important role in the causation No specific germ has been found /m

The patient is extremely weak and terribly wasted though the abdomen may at times be prominent and distended He may feel

famished but when given food can take very little of it and cannot digest it. He complains of slight abdominal pains and has diarrhoea the motions may not be very numerous they are liquid of faecaloid or at times of greenish colour with some mucus but no blood. The condition lasts usually between a couple of weeks and one to two months and very often terminates fatally.

The diagnosis is based on the history of starvation and extreme fatigue with diarrhoea without blood while the patient wastes horribly



A case of famine diarrhoea. Note extreme emaciation

in a short time and there are no signs of tuberculosis. It may be differentiated from dysentery by the stools not containing blood and by the absence of dysenteric germs from cholera by the longer course and absence of cholera and paracholera germs.

The prognosis is very serious most cases terminating fatally.

The treatment is very unsatisfactory. Astringents such as bismuth subnitrate etc. even when given in massive doses may not

stop the diarrhoea at times they may check it but the patient continues to waste glucose injections are useful but not curative

BRONCHO MONILIASIS

(Broncho candidiasis)

The term broncho moniliasis (broncho candidiasis) is used in practice *sensu lato* to denote not only bronchitis of monilial origin but also involvement of the lung of the same origin

Synonyms — Broncho alveolar moniliasis Broncho blastomycosis *pro parte*

Historical — This affection both the primary type and the much more frequent secondary type was first described by me in Ceylon My researches were soon confirmed by Piper Pantin Magrou and many others Recently a great deal of work has been carried out on the subject by Iacono Girolami Cannavo Urso Stovall and Greely Miale Martin Th Thyotta and Knut Urdal and others

Geographical Distribution — This disease is common in many parts of the Tropics and Subtropics and is found fairly frequently in many parts of the temperate zone and has been reported also from cold countries (Scandinavia)

It occurs in Portugal where during the last six years I have come across four cases of the primary type and quite a number of the secondary type

Aetiology — The disease is caused by fungi of the genus *Candida* Berkhout 1925 corresponding to the old medical genus *Monilia* (Auctores)

Recently doubts have been cast on the validity of the genus *Candida* but from a practical point of view I think that it is advisable for the time being not to change the nomenclature

According to many authorities the genus *Candida* belongs to the Subfamily Candidiodeae Family Torulopsidaceae (Order Blasto

porales Class Fungi Imperfecti Superclass Eumycetes Subphylum Mycetes Phylum Thallophyta) For simplicity I have retained it in the family Oosporaceae Saccardo 1886

These fungi appear in the lesions and in cultures under the form chiefly of free roundish or ovaloid budding cells usually about 4.5μ in diameter with little mycelium or to be more correct pseudomycelium composed of elongated cells produced by budding The cells become easily separated from each other Reproduction by blastospores Asci absent Their classification cannot be based simply on morphological characters but physiological characters and especially fermentative characters have to be taken into account With regard to the fermentative characters importance is given to the production or non production of gas not mere acidity

The chief species of the genus are the following *C. albicans* (with several varieties *C. albicans* var *candidans* *C. albicans* var *pinoyi* *C. albicans* var *metatondinensis* *C. albicans* var *triadis* and *C. albicans* var *stellatoidea*) *C. krusei* *C. tropicalis* *C. pseudo-tropicalis* *C. guillermonti* *C. bronchialis* *C. rhoi* *C. macedoniensis* In *C. macedoniensis* according to some authors among whom H. A. Diddens and J. Lodder asci are present and by these authors it has been removed from the genus *Candida* and placed in the genus *Saccharomyces* Meyen

Serologically according to the work done on the subject by myself and Mackenzie Douglas it would appear that by the results of agglutination and absorption tests several serological groups may be distinguished The first group contains *Candida albicans* and its varieties and also *C. tropicalis* the second group contains *C. pseudo-tropicalis* the third group contains *Candida macedoniensis* and its varieties and the fourth group contains *C. krusei* For the differentiation and classification of the species of the genus *Candida* many other laboratory methods have been employed among which the carbohydrate utilization test Castellani's absorption test the precipitin — absorption test

Mode of Infection — The infection may take place from man to man by droplets of sputum and also probably from the fungi living saprophytically in nature and their spores being found in the air

The infection takes place frequently by inhalation of dust containing virulent candidae. Fungi of the genus *Candida* are extremely common in Ceylon in tea dust and it is practically certain that the so called «tea factory cough» is a type of Moniliasis (Candidiasis). My old researches on the experimental reproduction of broncho moniliasis by inhalation have been confirmed and greatly enlarged recently by Urso. Some persons harbour candidae in the mouth and throat and in these individuals bronchomoniliasis may develop after a chill or any cause decreasing the natural power of resistance of the host. T. W. Keiper has found that in California about 3 per cent of normal individuals harbour candidae in the throat and in our experience it is quite easy to find candidae in scrapings from the back of the tongue in a large number of normal subjects. Some observers go so far as to say that pathogenic candidae are always present in the human oral cavity. The infection therefore in some cases may be endogenous.

Pathology and Morbid Anatomy — Little is known as comparatively few autopsies have been recorded. It would appear that in some cases a nodular condition of the lungs is found suggesting miliary tuberculosis. In these cases the histological examination of the nodules show to a certain extent the structure of true tubercle with giant cells but no tuberculosis bacilli are seen. Instead delicate yeast like organisms are present. In other cases bronchiectasiae and cavities and large ones of consolidation have been noted. In a few cases no gross lesions have been found.

In the post mortem held two hours after death of a case described by J. W. Flinn, R. S. Flinn and Z. M. Flinn in which *Candida albicans* var. *pinoyi* had been found in the sputum during life, the longitudinal sinus and the meningeal vessels appeared engorged with blood. The surface of the brain was markedly congested and here and there numerous small white masses were seen which microscopically consisted of yeast like cells. On section of the brain all vessels appeared congested and the fluids in lateral sinuses was increased. The pleura of the right lung was thickened and was adherent at intervals over the entire lung surface producing a series of pockets which however contained no fluid. In the left lung the pleura was thickened and the pleural cavity contained about 1 000 c.c. of fluid.

In the upper lobe of the left lung areas of incomplete consolidation were present. No gross changes were seen in the lower lobe. The bronchi were slightly dilated and presented the appearance of mild bronchiectasis. The bronchial glands were not enlarged and showed no pathological change. In the heart no gross changes were found. The liver and spleen showed passive hyperaemia.

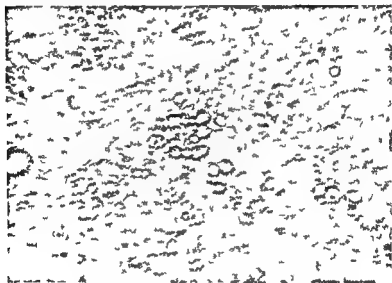
Cultures were made from the small white lesion on the brain surface from the choroid plexus from the left pleural space and from pneumonic areas in both upper lobes. Without exception all cultures yielded a growth of *Candida pinoyi* (= *C. albicans* var. *pinoyi*) which upon injection into the pulmonary tissue of rabbits produced characteristic granulomatous nodules. Cultures of these nodules yielded the same fungus.

Symptomatology — A mild and severe type of the malady may be distinguished. In the *mild type* the general condition of the patient is fairly good, there is no fever and he simply complains of cough. The expectoration is muco-purulent and very often scanty and no blood can be seen. The physical examination of the chest will reveal only a few coarse rales or absolutely nothing. The condition may last several weeks or months and may get cured spontaneously. It continuing may turn into the *severe type*. The *severe type* closely resembles phthisis: the patient becomes emaciated, there is hectic fever, muco-purulent and bloody expectoration. In several cases the sputum has a peculiar beer yeast odour. Occasionally true haemoptysis occurs, a teaspoonful of bright blood being spat up at a time. The physical examination of the chest may show patches of dulness, fine crepitations and pleural rubbing. This type is often fatal. Between these two extreme types there are of course cases of intermediate severity, apyretic or with subcontinuous and continuous fever and more or less marked bronchial and broncho-alveolar symptoms.

In mild cases roentgenograms of the chest usually show only a slight increase in the broncho-vascular marking over the lower lung fields. In cases of severe type a very definite generalized increase in the basal linear markings is noted, with at times a moderate infiltration in the lung parenchyma, usually in the middle or lower portions of the lung fields. In most cases the apices are relatively clear, although occasionally a heavy infiltration not unlike that of tuber

culosis may be seen extending well into an apex. Intrabronchial injection of Ipiodol may reveal presence of small bronchiectases in some cases.

An asthmatic type has been described (R. S. Flin, A. Castellani and very recently B. Urso) and exceptionally a generalised septico-pyemic type has been observed in which the fungus enters the general circulation producing abscesses in the skin and internal organs.



Sputum in a case of bronchomycosis (Bronchocandidiasis)
Note roundish bodies some budding

Complications — Thrush is occasionally seen. Pleurisy and empyema may develop. Meningitis may occur but is very rare. In exceptional cases, as stated, the *Candida* infection may become generalised with formation of multiple abscesses in the skin and internal organs. Endocarditis due to *Candida* has been described.

Mixed Infections — Cases of tuberculosis and moniliasis are not rare. In these cases the *Candida* is usually a secondary invader but

exceptionally it may be the primary causative factor the tubercular infection becoming engrafted on a chronic moniliasis

Cases of mixed infection, *spirochaetosis* and *moniliasis*, have been observed

According to Marett persons suffering from *candidiasis* if left untreated are very susceptible to pulmonary tuberculosis. In his experience the prognosis of a mixed infection *moniliasis* and *tuberculosis* is much more serious than that of tuberculosis alone

Diagnosis — In practice the diagnosis of Broncho moniliasis is based on constantly finding the fungus in the sputum while the tuberculosis bacillus (*Mycobacterium tuberculosis*) is constantly absent. It is absolutely necessary that the sputum should be collected in sterile petri dishes or some other sterile receptacle and examined as soon as possible as sputum exposed to the air becomes contaminated with all sorts of fungi especially in the tropics. In fresh preparations of the expectoration spore like roundish or oval cells 4 to 6 μ in diameter some budding are seen often presenting a delicate not well marked double contour. Some mycelial (more correctly pseudomycelial) particles maybe present. The fungus is Gram positive not acidfast.

The finding of candida in the sputum even if the sputum has been collected aseptically, should never be considered as sufficient ground for the diagnosis of primary moniliasis (candida is) as the fungus may play merely a saprophytic role. The diagnosis of primary Broncho moniliasis should be made only when the fungus as stated is constantly present in the sputum is pathogenic to rabbits by intrapulmonary injection while tuberculosis has been excluded by the absence of the tuberculosis bacillus microscopically and negative guinea pig inoculations. broncho *spirochaetosis* by the absence of *spirochaetes* *paragonimiasis* by the absence of the typical eggs *actinomycosis* and *pseudoactinomycosis* by the absence of *Actinomyces* and *actinomyces* like fungi *blastomycosis* by the absence of the so called *Blastomycoides* group of fungi cancer by the physical and X ray examination

To identify the fungus cultural researches are necessary. A particle of the sputum is smeared on maltose or glucose agar plates after two or three days white rather large roundish colonies appear easily distinguishable even macroscopically with a little practice from the

colonies of colci and other bacteria. The fungus colonies are further investigated by inoculating maltose agar, ordinary agar, gelatine serum and a set of sugar peptonwaters. All the species of *Candida* (*Monilia*) found in our cases grow well on ordinary agar but much more abundantly on maltose and glucose agar especially if slightly acid. On these media the growth which is generally white with a smooth surface when young slightly crinkled when old is composed practically of globular yeast like cells while in the water of condensation globular cells and mycelial elements are found together. A little mycelium (pseudo mycelium) may however be found also occasionally in the growth. All species of *candida* grow fairly well on coagulated serum but some later on induce a peculiar brownish black discoloration of the medium round the growth. Most species do not liquefy the medium.

On *gelatine* all the species grow fairly well a few produce liquefaction of this medium. In milk some do not produce either acid or clot others produce a temporary or permanent acidity others clot the milk or peptonise it. The reactions in the various sugar peptone waters are important and in association with the behaviour of the fungi on serum, gelatine and milk give the practical data on which to differentiate the various species although many other laboratory methods can be carried out.

Agglutination Test — The patient's blood contains agglutins for the infective *monilia* but very often the agglutination is not specific.

Complement Fixation Test — This may be carried out using as antigen cultures of the fungus.

Cutaneous reactions — Various cutaneous reactions have been introduced (scratch intradermic subcutaneous patch) using killed cultures of *moniliae* and filtrates. In practice they are not of much importance.

Differential Diagnosis — Primary Broncho candidiasis as described here should be distinguished from the secondary Broncho candidiasis not rarely met with in cachectic patients suffering from cancer, diabetes, tuberculosis etc. In such cases there is often thrush of the oral mucosa and the thrush fungus spreads to the pharynx.

larynx and bronchial mucosa while in primary broncho candidiasis the oral mucosa is not as a rule affected

From pulmonary tuberculosis the condition is distinguished by the absence of the tubercle bacillus in the sputum by the clear apices in the roentgenogram although there are exceptions and by the negative animal inoculations Cases of mixed infection however — tuberculosis and moniliasis — are occasionally met with the sputum containing both the tubercle bacillus and the *Candida* fungi

From Broncho spirochaetosis it is recognized by the absence of spirochaetes though occasionally cases of mixed infection occur from endemic haemoptysis by the absence of the ova of *Paragonimus ringeri* Cobbold From the various types of pulmonary «blastomycosis» by the absence of fungi of the *Blastomyces* *Torulopsis* *Coccidioides* *Paracoccidioides* type from pulmonary aspergillosis penicilliosis sporotrichosis and actinomycosis by the absence of fungi of the genera *Aspergillus* *Penicillium* *Sporotrichum* *Actinomyces*

Prognosis — The cases of a mild type may recover spontaneously or under appropriate treatment Those of the severe type often end fatally

Treatment — Mild cases and those of medium gravity respond often to potassium iodide (10 to 30 grains) given well diluted in water or milk three times daily When potassium iodide causes severe symptoms of iodism saladin in the same doses (in cachets) may be administered or collosol iodine 2 to 3 drachms in water t d In the cases of the severe type we have seldom seen an improvement from the many different treatments administered Potassium iodide however should always be tried also in the « cases as well as balsamics

Sodium iodide may be given intravenously 5 to 10 cc of a 10 per cent solution once or twice daily

Intratracheal injection of lipidol oil or some other iodized oil has been used occasionally with benefit *Candida* vaccines have been praised but we have seldom seen any good results from them

Calcium seems to be useful in some cases especially if associated with parathyroid therapy In mild cases we often prescribe Parke Davis tablets of parathyroid and calcium one to two three times

daily In severe cases calcium ■ given intravenously using a 10 per cent solution of calcium chloride 5 c.c. daily for periods of eight days Calcium gluconate may be given in a 10 per cent solution 5 to 10 c.c. either intravenously or intramuscularly

Various preparations of hypophosphites or glycerophosphites may be prescribed to try to keep up the patient's strength Syrup calciu hypophosphitis (B. P. C.) 1 to 2 teaspoonsfuls twice daily ■ a little water seems to be useful

Vitaminic preparations have been praised but are of very little use except as a tonic

Creosote may be given in capsules 2 to 10 drops daily Guaiacol may be given by the mouth in 5 drop doses In a few cases we have tried Durante's injection the formula of which is guaiacol 5 parts iodine 1 part potassium iodide 10 parts sterile olive oil 100 parts The dosage is one to five c.c. intramuscularly The injection is painful Guaiacol carbonate (duotal) may be given in 0.30 to 1 gram doses in cachets

Sulphonamides — These have little or no action but may be tried

Sulphadiazine is the best preparation 1 tablet (gram 0.50) every three hours

Antibiotics — Penicillin does not appear to have any beneficial effect Of the newer antibiotics Aureomycin is useful although it cannot be considered a specific drug

BRONCHO GEOTRICHOSIS (Broncho-Oidiosis)

Synonyms — Bronchial oidiomycosis Broncho endomycosis

History — Cases have been described by Blanchard Chantemesse and Vidal Linossier Pinoy/Castellani O. de Magalhaes and others in various parts of the Tropics and also in the Temperate Zone

Etiology — The causative fungi belong to the genus *Geotrichum* Link 1809 (*Oidium* Auctores) Following Langeron I place in the

genus only those fungi which reproduce solely by arthrospores without those in which more or less typical blastospores are present in addition to arthrospores which have been placed in the genus *Geotrichoides* of Langeron and Talice 1932. They may produce acidity in various sugars and other carbohydrates but never gas. The principal species which are capable of producing bronchitis and bronchoalveolitis are *Geotrichum candidum* Link 1809 (= *Oidium lactis* Fresenius 1850), *Geotrichum rotundatum* Castellani 1911 (= *Oidium rotundatum* Castellani), *Geotrichum asteroides* Castellani 1914 (= *Oidium asteroides* Castellani), *Geotrichum matalense* Castellani 1915 (= *Oidium matalense* Castellani), *Geotrichum rugosum* Castellani 1910 (= *Hemispora rugosa* Castellani 1910), *Geotrichum pararugosum* Castellani, Douglas and Thompson. The last is merely a variant of *rugosum*.

Some fungi which used to be placed in the genus *Geotrichum* by several authors but which present blastospores in addition to arthrospores have been removed by Langeron, Brumpt & others from that genus and placed in the genus *Geotrichoides* Langeron & Talice 1932.

Among these fungi a species of great interest is *G. brasiliense* O de Magalhães 1917 which is extremely virulent and when inoculated into the lower animals always localizes itself in the lungs whatever route of inoculation is used — subcutaneous, intravenous or intrapulmonary. In laboratory animals the smearing of a culture of this fungus on the oral mucosa causes pulmonary pseudo tuberculosis, the fungus apparently being absorbed through the tonsils. It has recently been identified with *Geotrichoides cutaneum*.

Symptomatology — The symptoms are very similar to those seen in broncho moniliasis and a severe type and a mild type of the affection may be distinguished. In the mild type the general condition of the patient is good, there is no fever and he simply complains of cough. The expectoration is mucopurulent and does not contain blood. The physical examination of the chest is negative or reveals only a few rales. The severe type closely resembles phthisis. The patient becomes emaciated, there is hectic fever and the expectoration may be haemorrhagic. The physical examination may reveal patches of dulness, fine crepitations, pleural rubbing.

Complications — The affection may be complicated with a tonsillitis caused by the same fungi and characterized by the presence of yellowish or greyish patches at other times the tonsillitis is the primary lesion

Diagnosis — The diagnosis is based on finding in the sputum fungi with the characters of *Geotrichum* a genus characterized by complete absence of spores excepting arthrospores and almost complete absence of serial mycelium in cultures. In the sputum and in cultures typical yeast-like cells are not seen but only mycelial articles and segments of articles (arthrospores)

Prognosis — This is very serious in the severe form and practically hopeless when the condition is caused by *Geotrichum brasiliense* C de Magalhaes which however is not a true geotrichum — It must be remembered that primary geotrichosis is rare

Treatment — Potassium iodide should be given in large doses

BRONCHO SPOROTRICHOSIS

The term *broncho sporotrichosis* — is used to denote any affection of the bronchi and lungs due to fungi of the genus *Sporotrichum* Link 1809. These fungi in practice may be defined as Fungi Imperfecti of the order Conidiosporales characterized by the conidiophores being practically undifferentiated from the ordinary hyphae and the presence of terminal loose clusters of conidia («bouquets» of French authors) as well as of numerous lateral conidia born on pedicell. These latter conidia fall out rapidly and the fertile hypha remaining with the pedicell takes on the aspect of a «rasp» (radula) hence these conidia are referred to as radulospores

The best known species according to some authorities, the only human species, is *Sporotrichum shenki* of which a short description is herewith given

Sporotrichum shenki (Hektoen and Perkins 1900) (= *Sporotrichum schenki beurmanni* Auctores)

Synonyms — *Sporothrix schenki* Hektoen and Perkins 1900
Rhinocladium beurmanni Verdun 1913 *Sporotrichum beurmanni*
 Matruchot and Ramond 1905 *Sporotrichopsis beurmanni* Guéguen
 1911 *Rhinotrichum beurmanni* Ota 1928

Discovered by Schenk in a case of gummatous lymphangitis in 1896 in North America Completely investigated by Ektoen and Perkins who called the organism *Sporothrix schenki* Found later by de Beurmann in France and completely investigated by himself and Ramond Gougerot Dor Sicard Pinoy etc in that country by Adamson in England by Lutz and Splendore in South America by Carougeau in Madagascar etc It was believed at one time that the fungus found by de Beurmann in France was a separate species differing from *S. schenki* in the more abundant conidia in the colonies always becoming black in not acidifying lactose while acidifying saccharose The researches of Davis and many others have clearly shown that these differential characters are very inconstant as quite a number of American strains produce dark pigmentation show abundant conidia and acidify saccharose and not lactose

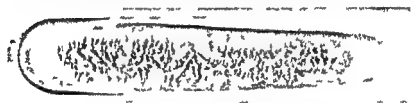
Parasitic Life — In the tissues oval yeast like or short bacillary forms are seen $3.5\ \mu$ in breadth free or engulfed by phagocytes Pinoy has described some minute oval forms of the shape and size of piroplasmata inside the macrophages In a case of general infection he has made the important observation that typical fructifications may be seen in the blood capillaries

Cultures — The best media are Sabourand's maltose agar and glucose agar The growth begins to appear between the fourth and the twelfth day Optimum temperature is $22\ ^\circ\text{C}$ but grows well also at 30 to $38\ ^\circ\text{C}$ The growth may be whitish at first but soon becomes completely black or of a brownish chocolate like colour The surface is irregular or cerebriform Glucose gelatine is slowly liquefied Serum usually is not liquefied Mycelial threads about $2\ \mu$ in diameter rather straight but may be bent curved or undulating Conidia oval $5.6\ \mu$ in length and $3\ \mu$ in breadth supported by very short sterigmata The conidia may be extremely numerous and are collected in lateral and terminal clusters at times form cylindric masses $10\ \mu$ in diameter Chlamydospores may be present in large numbers when the fungus

is grown on poor media Glucose levulose maltose galactose glycerol and inulin are acidified Some strains acidify saccharose not lactose others lactose not saccharose

Pathogenicity — Is the cause of by far the greatest number of cases of sporotrichosis in Europe and America Is very pathogenic to rats and mice and also to monkeys It has been found by Beurmann and Gougerot living saprophytically on vegetables and grains

Benham and Kest (1932) have shown that inoculating experimentally certain carnations and rose plants with this fungus they show signs of disease and decay in practically the same manner as when they are naturally infected with *Sporotrichum poae* The same



Sporotrichum glaucum Cast. Glucose agar culture 15 days old

authors have demonstrated that *Sporotrichum poae* as well as *Sporotrichum pruinosum* found in the soil are not pathogenic to laboratory animals Catanesi in 1929 has shown that a saprophytic species of *Sporotrichum* isolated from the water of a well in Algeria by Beguet close to *S. biparasiticum* Bubak 1906 may be pathogenic to the rabbit guinea pig white mice and monkeys when experimentally inoculated

Sporotrichum shenkii apparently has not much tendency to invade the respiratory system as it is rather exceptional to find the bronchi and lungs affected in cases of cutaneous sporotrichosis and primary broncho sporotrichosis due to it is extremely rare and I have never seen a case of it and as far I know no case of it has been placed on record

In all my cases of Broncho sporotrichosis the fungus found was a totally different one which I called *Sporotrichum anglicum* Cast

It differs from *Sporotrichum shenkii* in never becoming pigmented and in producing gasfermentation of glucose and several other sugars.

A short description of *Sporotrichum anglicum* is herewith given —

In the sputum it appears under the form of yeast like cells and short mycelial articles and also filaments but no «bouquets» Gram positive

Cultures — The fungus grows easily on glucose agar and all the usual laboratory media. On glucose agar the growth is of a white or greyish colour occasionally with a yellowish tone and shows a slightly rugose or wrinkled surface at times rather moist covered with very short white duvet. On ordinary agar prepared with broth the growth is rather scanty. Dextrine agar cultures are very similar in appearance to agar cultures. On soluble starch agar the growth is abundant and very similar to the growth on glucose agar. On potato the fungus grows well and the colony shows a white somewhat chalky surface. Carrot cultures are very similar to potato cultures having a white chalky appearance. On coagulated serum there is abundant growth whitish with at times a greenish tinge no liquefaction.

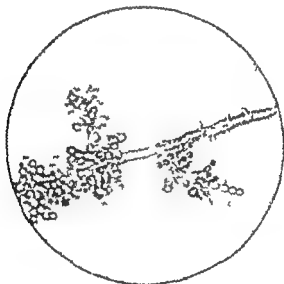
When a glucose agar plate is inoculated from a sugar peptone water culture colonies develop which have a tendency to remain separate and their surface often shows spicules.

Hanging Drop cultures — In hanging drop cultures the mycelium is abundant. Conidia numerous lateral or in terminal clusters. Conidia mostly borne on minute pedicella and numerous lateral denticles can be seen on some hyphae. The conidia are generally of oval shape averaging $4.6 \times 3.5 \mu$ but some conidia may have a maximum longitudinal diameter of 7μ and others a maximum longitudinal diameter of only 3μ . The mycelial hyphae are about 3μ in diameter but some may be as much as 4μ and others as little as 2μ in diameter.

Biochemical Characters — No liquefaction of gelatine or serum. Milk not coagulated generally rendered alkaline. The fungus produces acidity and gas in glucose and several other sugars. Both strains kept in my collection have the same fermentative reactions producing acid and gas in glucose levulose maltose and saccharose and not

gas fermenting mannite galactose rhamnose inositol adonitol arabinose amygdalin salicin sorbitol dextrine erythritol xylose arbutin starches Does not liquefy serum or gelatine does not clot milk

Pathogenicity — In all probability the fungus is a pathogenic one as in the cases of severe bronchitis in which it was found it gradually decreased in amount and finally disappeared from the sputum



Spore of chlamydomonas Cast. Hanging drop culture

when the patients were placed on iodine therapy and began improving. The patients recovered. In a case in which *Candida* was also present both fungi disappeared and it is quite possible that both organisms had a part in the aetiology of the condition.

Classification — The abundant mycelium, the extremely numerous conidia borne laterally on very short pedicels and also collected in large terminal and lateral clusters and the presence of hyphae

with numerous denticles or minute papillae justify placing this organism in the genus *Sporotrichum* Link 1809. It differs from *S. shen* in the colonies never becoming brownish black or black and from it and all described species in producing gas in glucose and some other sugars.

Symptomatology — Two forms of Broncho sporotrichosis may be distinguished — 1) Primary Broncho sporotrichosis 2) Secondary Broncho sporotrichosis. The first type is characterized by the affection starting in and remaining limited to the bronchi and lungs. The second type is characterized by developing usually after a long time in cases of cutaneous and subcutaneous sporotrichosis. In the first type only *Sp. anglicum* has so far been found. Severe cases closely resemble tuberculosis.

Diagnosis — The diagnosis is based on the microscopical and cultural examination of the sputum. The microscopical examination will show the presence of yeast like cells in certain cases while in others it will be completely negative. The sputum should be inoculated into several tubes of glucose or maltose agar and left at room temperature for several days. When colonies appear they should be mycologically investigated.

Prognosis — The prognosis is quite favourable provided a correct diagnosis is made at an early stage and the appropriate treatment given.

Mixed Infections — Broncho sporotrichosis + Broncho candidiasis are not very rare. One such case was described by me in England.

Treatment — The best treatment is by Potassium iodide to which it answers much more rapidly than bronchomycoses due to other fungi.

4 DISEASES OF THE GENITO URINARY SYSTEM

I propose spending a few words on urethrites and vaginites of fungal origin and on a little known cystitis due to the metadysentery bacilli. I will also very briefly discuss lactosuria in the tropics although it cannot be considered a disease.

URETHROMYCOSES

Urethrites of fungal origin may be classified as follows

- 1 Discharge whitish or yellowish
- 2 Discharge reddish or pinkish
- 3 Discharge dark brownish or greenish black or black

1 *Mycotic Urethritis with Whitish or Yellowish Discharge* — This condition is not rare. I have seen several cases in the tropics and a few in the Balkans and Southern Europe. The discharge is generally present in small amount and is mucoid but occasionally it may be fairly abundant and may closely resemble gonorrheal urethritis. The fungi found generally belong to the genus *Candida* (*Monilia*).

In Ceylon I noted the condition — due to *Candida* (*Monilia*) — in several cases of diabetes in these cases the candida may affect not only the urethra but also the glans penis producing a white membrane (thrush of glans penis) in certain cases the glans penis and corona are affected but not the urethra.

ILLUSTRATIVE CASE

During the First World War a young Serbian Officer in Macedo consulted me for a fairly abundant purulent urethral discharge. He was distressed he was engaged to be married and believed he was suffering from gonorrhoea though he denied having exposed himself to infection. I examined the secretion gonococci were not present, instead a large number of yeast-like cells and a few mycelial forms could be seen. The cultural test also showed the presence of a *Candida*. I prescribed a mixture containing potassium iodide and sodium bicarbonate.

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greenish black or brownish. In certain cases minute granules may be present which on microscopical examination are seen to consist of mycelial threads and spore like bodies. The fungi found generally belong to the following genera: *Cladosporium*, *Aspergillus*, *Penicillium* and rarely *Torulopsis* (*Cryptococcus*), *Monilia* (*Candida*) and *Actinomyces*.

ILLUSTRATIVE CASE

An old Tamil coolie came to the Colombo Clinic in January 1906 complaining of black vaginal discharge dating from several months back. He stated that he had not had sexual contact for some years. The secretion was blackish and contained numerous small granules which on microscopic examination were seen to consist of mycelial threads and spore like bodies. Various s.g. media were inoculated and a fungus was grown which produced a black pigmentation and was apparently somewhat similar in character to *Cladosporium manni* Castellani. In two other clinically similar cases one in a native and the other in a European I found aspergillus-like fungi. In another case I found an *actinomyces* which gave rise to black colonies in another yeast like fungus which produced a black pigmentation.

MYCOTIC VAGINITIS

It may be said in general that in normal women of clean personal habits fungi are not found or are extremely rare in the healthy vagina. When a vaginal discharge is present fungi are not at all rare.

The fungi I have found belong principally to the following genera

Candida, *Saccharomyces*, *Torulopsis* (*Cryptococcus*), *Actinomyces*, *Aspergillus*, *Stenigmatocystis*, *Penicillium*, *Cladosporium*, *Alternaria* and *Geotrichum*. By far the most common are fungi of the genus *Candida* (*Monilia*).

They seem to be encountered much more frequently in hot climates than in cold countries.

Are these fungi or some of them really pathogenic? It has been stated that fungi of the *saccharomyces* type may be beneficial because they have a tendency to increase the acidity of the vagina and in this way may render more difficult the growth of pyogenic germs.

Probably the fungi I have mentioned when present in small amounts act only as saprophytes but when present in large numbers

glycerine syrup of tolu and irrigations with a solution of corrosive mercuri chloride 1 20 000 The discharge disappeared completely within ten days

2 *Red Mycotic Urethritis* — This conditions is rare but I have seen ■ few cases in the tropics the Balkans and Southern Europe I have also seen ■ case in New Orleans

The urethral discharge is usually in exceedingly small amount mucous or muco purulent reddish or pinkish The cases of this condition may be divided into the following groups

1 — The discharge is associated with a red pigment producing torulopsis (*cryptococcus*)

2 — The discharge is associated with a white candida fungus plus a red pigment producing torulopsis

3 — The discharge is associated with a white candida plus a red pigment producing coccus

4 — The discharge is associated with a white candida and a red pigment producing bacillus

ILLUSTRATIVE CASES

Case 1 — A little Singhalese boy aged six years was brought to my clinic in Colombo by his parents because they believed he was passing blood from the urethra The discharge examined microscopically consisted of some leucocytes and numerous budding cells Several sugar agar tubes were inoculated and a red pigment producing torulopsis (*cryptococcus*) was grown The child was given an alkaline mixture and instillations of diluted glycerine of borax were carried out This however did not improve the condition Urethral injections of a solution of perchloride of mercury 1 20 000 were then made and a speedy cure resulted

Case 2 — Mr L N Italian for the preceeding eight months had noticed ■ slight pinkish or reddish discharge Pain was not felt in passing urine The microscopic examination showed absence of gonococci and presence of numerous coccal organisms and some yeast like germs The fungus (of the genus *Candida*) I have grown several times in symbiosis with a red pigment producing coccus I have separated the two organisms with some difficulty The fungus gives rise to cream like colonies while the coccus growth is a beautiful red

3 *Black Mycotic Urethritis* — This condition ■ exceedingly rare but I have seen cases in the tropics and in Southern Europe The discharge is present in small amount and is usually blackish / 57

without any distinctive objective symptoms pointing to an epidermophytic infection

Mycotic Vaginitis with Red Discharge — I have seen only one case. It was apparently due to a red pigment producing *Torulopsis* (*Cryptococcus*) present in enormous numbers. It is of course possible that the vaginitis may have been of some other origin and that the *Torulopsis* (*Cryptococcus*) merely caused the peculiar reddish colour of the mucopurulent secretion. In addition to the *Torulopsis* (*Cryptococcus*) there were present in small numbers a Gram negative bacillus which I did not determine and some few Gram positive cocci of the staphylococcus type.

Mycotic Vaginitis with Black Discharge — In old native women in the Far East occasionally a vaginal discharge may be present in which small black granules are seen. Fungi of the genera *Aspergillus* and *Penicillium* have been grown.

Transmission of Fungal Infection by Sexual Contact — As certain species of fungi have been found in both the male urethra and the vagina it is not impossible that in certain cases the infection may take place by sexual intercourse.

CYSTITIS METADYSENTERICA

(Metadysenteric Cystitis)

This is a form of cystitis the true aetiology of which is often overlooked. It was first investigated by me nearly two decades ago at the Ross Institute and Hospital for Tropical Diseases in London with the very valuable assistance of Dr Mackenzie Douglas. I have recently observed a case in Portugal.

The disease is due to organisms of that group of intestinal bacteria which I called the metadysentery bacilli and for which Cerruti created the genus *Costellanus*. These organisms differ from the dysenteric bacilli (Shiga Kruse) and the paradysenteric bacilli (Flexner and Flexner like) in fermenting (acidity only) lactose and coagulating milk. The three chief species are *B. feylonensis*. A. Cast 1907

they produce inflammation I have seen cases of vulvovaginitis in which the mycotic origin was practically certain. Similarly to the cases of mycotic urethritis they may be grouped as follows

- 1 With white or yellow discharge
- 2 With red discharge
- 3 With black discharge

Those of the first group are by far the commonest the other two groups are exceptional

Mycotic Vulvovaginitis with white or White Yellow Discharge
Generally fungi of the genus *Candida* (*Monilia*) are found in large numbers. Three clinical types associated with the presence of *candidae* may be separated: a) the membranous type or «vaginal thrush» — thrush-like patches are present on the mucosa; b) the purulent type — such patches are not present but the secretion is thick and purulent and in my experience these cases have not rarely been mistaken for gonorrhoea; c) a mixed type: thrush-like patches are present and the discharge is purulent and thick.

In 1914 in Ceylon I had the following experience. The surgeon in charge of the Colombo Gynecological Hospital had a patient a middle aged Singhalese woman in whom a pelvic operation was urgent. A thick purulent vaginal discharge was noted and he felt inclined to postpone the operation as he suspected a possible gonorrhoeal infection. In those days of course there were no sulphad drugs and no antibiotics.

I was asked to examine the discharge. Gonococci were not present; instead there was an enormous number of mycelial and budding elements. Further investigations revealed the fungus to be *Candida albicans* var. *pinoyi*.

Attention might also be directed to the presence of numerous *candidae* (*moniliae*) in certain cases of chronic vaginal pruritus although the role played by *candidae* in the causation of the pruritus has not been completely proved. Attention might also be called to a variety of pruritus vulvae and pruritus ani caused by the localization of thrichophyton-like fungi associated with *Candida* fungi in the ano-perineal region and external surface of the labia majora.

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(*B. sonnei* Levine 1921) *B. ceylonensis* B Cast 1907 and *B. madampensis* Cast 1911 See also p 1920

Symptomatology — Clinically this form of cystitis can hardly be separated from the cases of medium gravity cystitis due to *B. coli*. The patient complains of pain in passing urine and the desire to pass urine frequently; there is often pain in the suprapubic region. There may be ~~be~~ fever but this is not a constant feature. When present the fever is usually of low, continuous, intermittent or irregular type. The urine in the majority of cases on microscopical examination shows presence of pus cells, very occasionally of red blood cells. The bacteriological examination of the urine collected by catheter will show presence of bacilli of the metadysentery group either alone or mixed with *coli* and other organisms. Some cases run an acute course lasting only a few days but in many cases the course is subacute and there is great tendency to chronicity. In the past, once it had become chronic, the condition was very difficult to cure but at present most cases answer to sulphonamides.

ILLUSTRATIVE CASE

Case 1 — Mr. aged 38. The patient consulted me several times in October 1931. He had been suffering from chronic colitis and cystitis for many years. The stools contained histolytica cysts. By cultural method *B. madampensis* was grown. The urine contained a large amount of pus. No catheter was used. After cleaning the glans penis with warm boric lotion he was made to pass urine in three sterile vessels. The urine of the second vessel was examined bacteriologically. On MacKonkey plates numerous red colonies and also several white or whitish pink delicate colonies were seen. Further investigation showed that the red colonies were colonies of *B. coli* var. *communior*, the white colonies of *B. madampensis*, the same bacillus found in the stool. The organism was agglutinated by the patient's serum in a dilution of 1:360 and by a standard *madampensis* serum in a dilution of 1:1200. The *madampensis* strain isolated from the patient was serologically and biochemically identical with the laboratory strains of *B. madampensis*.

Case 2 — Little girl aged 8, the daughter of a medical man. Had severe colitis when 4 years old. Developed acute symptoms of cystitis in June 1929. The urine was aseptically collected by her father using a catheter. It was acid and contained numerous pus cells. The bacteriological examination showed presence of *B. ceylonensis* A in pure culture. The organism showed all the biochemical reactions of the typical *ceylonensis* A and was agglutinated by *B. ceylonensis* A serum.

Case 3 — Italian 29 years of age passing through Lisbon consulted me in February 1950 for chronic cystitis. Did not give history of intestinal trouble. The bacteriological examination of the urine showed presence of *B. madampensis*. Sulphadiazine (one tablet 0.50) every three hours answered very well.

Mixed Infections — In most cases *B. ceylonensis*, *B. II ceylonensis*, *A. B. madampensis* are found in pure cultures. In chronic cases they are usually associated with *B. coli* and occasionally with streptococci and proteus.

Diagnosis — This is based on the bacteriological examination of the urine.

Prognosis — The prognosis is favourable *quoad vitam* but in a number of cases the condition becomes chronic and was most difficult to cure before the introduction of the sulphonamides.

Treatment — The sulphonamides especially sulphadiazine answer admirably.

LACTOSURIA IN THE TROPICS

In some parts of the tropics lactosuria in nursing women seems to be more common than in Europe. The general health is not affected but many of these cases are diagnosed as diabetes when the usual copper reduction methods are employed in examining the urine. I strongly recommend using the mycological and bacteriological methods found and introduced by me in 1917 with the assistance of Dr Taylor for the detection and determination of various sugars in the urine.

Next to dextrose lactose is the commonest sugar found in the urine. It is encountered frequently in the urine of nursing mothers. Lactose as is well known reduces Fehling's and Benedict's solutions and not infrequently lactosuria has been mistaken for true glycosuria. It is most important to distinguish between the two conditions as lactosuria is not serious while glycosuria especially in nursing women is of grave prognosis. The chemical detection and determination of lactose is difficult for an ordinary medical man. In most text books it

is stated that if a urine reduces Fehling's solution and is not fermented by ordinary baker's yeast (so called German yeast or brewer's yeast) the presumption is that the reducing substance is lactose. There are however two important sources of error.

First a number of specimens of baker's yeast ferment lactose in addition to dextrose, maltose and other sugars; second even if the baker's yeast should not ferment lactose this is not the only substance that reduces Fehling's solution which may not be fermented by baker's yeast — pentose for instance.

If a urine which reduces Fehling's solution is not fermented by ordinary yeast it cannot therefore be concluded that the condition is lactosuria.

Detection and Determination of Lactose by the Mycological Method — The copper reducing urine freshly passed is boiled for one minute and distributed into two sterile saccharometers. To the urine one third of peptone water may be added to facilitate the growth of the organisms.

One of the two saccharometers is inoculated with *E. coli* (*Escherichia coli*) and the other with *Salmonella paratyphosa B* (*S. schottmuelleri*). If after forty eight hours in the incubator at 35–37°C the tube inoculated with *Es. coli* contains gas and the other not we may come to the conclusion that the urine contains lactose.

In the urine that reduces Fehling's solution for practical purposes the following formula is correct:

$$\left. \begin{array}{l} \text{I } \textit{Escherichia coli} \text{ (Escherich)} \\ \textit{Salmonella paratyphosa B} \text{ (Schottmuller)} \end{array} \right\} \begin{array}{c} + \\ \text{O} \end{array} = \text{lactose}$$

The reason is that with regard to the fermentable copper reducing substances which may be found in the urine both organisms gas ferment the same substances excepting lactose which is fermented by *coli* but not by *paratyphosus B*; therefore a urine which is gas fermented by *coli* and not gas fermented by *paratyphosus B* and Fehling reducing must contain lactose.

Escherichia coli and *Salmonella paratyphosa B* besides lactose differ in their action on raffinose, salicin and glycerol but raffinose

and salicin are not carbon compounds found in the urine and at any rate they do not reduce Fehling's or Benedict's solution

I will mention two other mycological formulae indicating the presence of lactose

II	<i>Candida (Monilia) pseudotropicalis</i> Cast	+	}	= lactose
	<i>Candida (Monilia) macedoniensis</i> Cast	O		
III	<i>Candida (Monilia) pseudotropicalis</i> Cast	+	}	= lactose
	<i>Candida (Monilia) tropicalis</i> Cast	O		

The sign + is used to indicate production of gas

The reader interested in the mycological methods for the detection and determination of various sugars and other carbohydrates both copper reducing and not copper reducing e.g. maltose galactose pentose saccharose inulin may consult the section on the subject in my old monograph *Fungi & Fungous Diseases* (Chicago 1927) or my papers published in the *Annales Institut Pasteur* 1930 (First Int Congress of Microbiology Paris) and *Journal of State Medicine* vol XXXIV No 11

MALTOSURIA

Maltosuria is a rare condition but is occasionally seen in heavy beer drinkers. Some time ago I had a case from South Africa where the patient was diagnosed as diabetes. He had been a heavy beer drinker for years.

The patient was in good general health and the glycemia was within normal limits. I detected his condition using one of my old mycological methods. The urine freshly passed (Fehling reducing) is sterilized in flowing steam twice at a few hours interval in Koch's stove. In practice it is simpler to boil the urine for one minute; this will not usually cause any alteration in the sugar present. It is then distributed in two tubes containing Durham's fermentation small tubes or in two saccharometers. It is of advantage to add about 1/3 the volume of peptone water. One of the tubes is inoculated with *Candida (Monilia) tropicalis* Cast and the other with *Candida macedoniensis* Cast. If after three days in the incubator at 35-37°C

tube N 1 shows gas fermentation and tube N 2 does not show any gas fermentation we may conclude that the Fehling reducing fermentable substance in the urine is maltose. The explanation is the following. With regard to Fehling reducing carbohydrates which may be present in the urine *Candida tropicalis* gas ferments glucose levulose mannose galactose ■ maltose. *Candida macedoniensis* gas ferments glucose levulose mannose galactose not maltose. The urine has been gas fermented by *Candida tropicalis* and therefore the Fehling reducing fermentable substance present must be glucose or mannose or levulose or galactose or maltose. But had it been glucose levulose mannose galactose it would have been gas fermented also by *Candida macedoniensis*. The Fehling reducing substance present must therefore be in all probability maltose.

GALACTOSURIA

A certain amount — about 20 cc — of the copper reducing freshly passed urine is sterilized — in practice boiling for one minute is sufficient — and placed into two tubes containing Durham's fermentation small tubes or into two saccharometers. It is of advantage to add 1/3 the volume of sterile peptone water as found in all bacteriological laboratories to facilitate the growing of the diagnostic organisms. Tube N 1 is inoculated with true *B. morganii sensu stricto* (Morgan bacillus N 1 which does not touch maltose). Tube N 2 is inoculated with *Candida krusei*. If after three days of incubation at 35-37°C tube N 1 contains gas and tube N 2 does not the inference is that the fermentable copper reducing substance present is galactose. Why? With regard to fermentable copper reducing substances which may be found in urine *B. morganii sensu stricto* (Morgan's bacillus N 1) ferments with production of gas only glucose levulose galactose and therefore the copper reducing substance can only be in practice either glucose or levulose or galactose but had it been glucose or levulose it would have been gas fermented also by *Candida krusei*; it must therefore in all probability be galactose.

PLNTOSURIA

This condition is not extremely rare and the pentose present is generally arabinose. For the detection and determination of it the following simple method may be used. The Fehling reducing urine freshly passed is sterilized in flowing steam or in practice much more simply by boiling for one minute which as a rule does not alter the constitution of any sugar present. The urine is then poured into two tubes containing a Durham's fermentation small tube or in saccharometers. Tube N 1 is inoculated with *Bacillus paratyphosus* A and tube N 2 with *Bacillus asiaticus* Cast. If after three days in the incubator at 35-37 C tube 1 shows gas fermentation and tube 2 shows no gas fermentation we can conclude that in all probability the Fehling reducing substance present is arabinose. The reason is that with regard to the usual Fehling reducing substances which may be found in the urine *Bacillus paratyphosus* A and *B. asiaticus* ferment the same substances excepting arabinose which is fermented by *B. paratyphosus* A and not *B. asiaticus*. If a Fehling reducing substance is gas fermented by *B. paratyphosus* A and not by *B. asiaticus* it must in all probability be arabinose.

5 DISEASES OF THE ORGANS OF SPECIAL SENSE

In the tropics and occasionally in the temperate zones the regions of the canthi particularly of the inner canthus frequently show a white accumulation of matter or a white pellicle. The pellicle may extend to the whole of the palpebral rims both upper rim and lower rim. It is easily removable and as a rule there are no subjective symptoms except an occasional slight itching sensation. The condition is more common in elderly people than in young people and is considered by some authors a form of blepharitis.

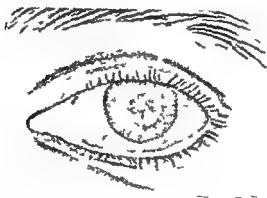
Actiologically there are two principal types — the fungal and the bacterial.

In the mycotic type yeast like fungi are observed usually belonging to the genus *Candida*. When the fungal variety is caused by

a *Candida* and a large pellicle is present the term ocular thrush may be used

In the bacterial type a diphtheroid bacillus is found in enormous numbers either alone or with a few cocci

A mixed type mycotic and bacterial is occasionally seen



Leucopellicula oculi due to Candida

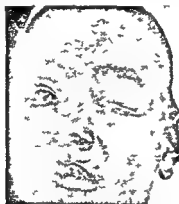
OCULAR EMETINE CONTACT SYNDROME

(Emetine impact delayed pain)

In the tropics and subtropics where so many emetine injections are given it is not at all rare for an ampoule to get broken and part of the contents to get into the operator's eyes. At first he feels nothing at all and the conjunctiva does not become inflamed and he forgets about the accident. Ten to 24 hours later while he is usually asleep he wakes with a terrific excruciating pain in the ball of the eye. The patient who I say again has generally forgotten the accident goes to see an eye specialist who not knowing the history finds himself nonplussed and hardly knows what to advise. The pain gradually disappears spontaneously 48 to 72 hours after onset though occasionally it may take much longer. During the attack of the extremely severe pain morphia injections may be necessary.

SUDAN OEDEMA OF THE EYELID

In the Sudan and especially in Khartoum a peculiar acute oedema of the eyelids affecting one or both eyes has been known for many years but the cause was unknown until Chalmers and Marshall (1918) carried out some researches on the subject and found that it was due to the bites of an ant. The patient goes to bed at night in perfect health — in the morning on awakening he will find that his eyelids



Case of Sudan oedema of the eyelid

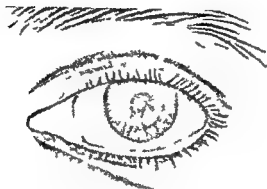
are swollen occasionally slightly painful and irritable. On close examination one can very often see one or two minute spots which when double are close together and look as though caused by a pinch with something sharp. The swelling naturally causes some alarm but it subsides after treatment with fomentations with warm boric lotion.

The condition is caused by the bites of a small ant which the Sudanese natives call *darra* and which infests the native huts and the rooms and beds of the European residents. The ant seems to belong to the genus *Monomorium* Mayr 1885 and possibly it is a variety of the species *M. minutum* Mayr 1885. The best way of

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keeping the ant away from the beds is to sprinkle the sheets and blankets with powdered camphor and to place the feet of the bedpo ts in small tins or other receptacles containing a disinfecting solution such as strong lysol solution 10 % carbolic acid 5 % or a strong infusion of native tobacco

OTOMYCOSIS

Various fungi may be present in the external auditory canal without causing any symptoms In some cases however the fungus multiplies abundantly and may be the cause of a local inflammation or may apparently facilitate the formation of a wax plug In several cases I have found a *Candida* which I have called *Candida rhoi* (*Monilia rhoi*) probably a variant of *Candida tropicalis* In two cases of otomycosis I have found a fungus belonging to the family *Mucoraceae* *Lichtheimia ramosa* Lindt 1886 It was present in great quantity and the patient complained of tinnitus aurium and great deafness It is interesting to note that this fungus is often found in the nasal mucus of horses and that both my cases were Tamil muttos (horse keepers) Various authors (Stiebenmann Boke Huckel and others) have recorded cases due to *Lichtheimia corymbifera* Cohn *Rhizomucor septatus* Von Be old Maggiora and Gradenigo found *Saccharomyces ellipsoides* Rees in cases of chronic otitis media The same authors found a new species of *Saccharomyces* (*S roseus*) in the Eustachian tubes

Aspergillomycosis of the ear is comparatively frequent I have seen several cases in Ceylon and later New Orleans apparently due to *A fumigatus* Fresenius Gramer observed *A niger* Von Tiegham Wreden *A flavus* De Bary and *A nidulans* Eidam Fungi of the order Basidiomycetes family Ustilagineae have also been observed *Ustilago carbo* and *Tilletia levis* Of the order Hyphomycetes sensu stricto *Trichothecium roseum* Persoon 1801 has been observed in a few cases I may mention here that a satisfactory treatment I have found for the various forms of otomycosis is instilling the antimycotic fuchsin paint known by my name and better still pouring it in large amount

SYMMETRICAL EAR NODULES

This condition was described by me in Ceylon in 1910. It is rare. In the deep substance of the lobule of both ears — generally the condition is symmetrical — a small spherical nodule hardly visible is felt on palpation. Occasionally a nodule becomes much larger, is of elastic consistency, the size of a pea to a cherry, at times even larger, and becomes very tense, and may present a somewhat translucent appearance. After some days it becomes smaller again and may be hardly visible. There are, as a rule, no subjective symptoms during the periods of quiescence; a feeling of slight pain and tension is felt during the periods of increase in the size of the nodules. The condition is not leprotic, there being no anaesthesia or other signs of leprosy.

It may possibly be of parasitic origin, but nothing definite can be stated, as none of my patients would allow the removal of the nodule.

An account of the condition may be found in Castellani & Chalmers' *Manual of Tropical Medicine*, 1919.

RHINOMYCOSIS

Yeast like and other fungi are often observed in the nasal mucus; they may play only a saprophytic role, or they may give rise to an inflammation of the mucosa. In Colombo a little native boy was brought to me by his parents, who stated that he had been suffering from repeated attacks of severe sneezing for the last three months, and they had observed that on blowing the nose minute black dots were coming out with the mucus. Microscopical and cultural investigation showed the case to be one of aspergillosis due to *A. niger*. In the literature cases of aspergillosis due to *A. glaucus* De Bary and *A. fumigatus* Fresenius have also been described. In New Orleans, in a case of chronic sinusitis, a beautiful red pigment looking fungus was found which could not be identified.

6 LITTLE KNOWN TROPICAL SURGICAL DISEASES AND SYNDROMES

I will limit myself to saying a few words on a still little known surgical condition described by me many years ago under the name of endemic funiculitis and on certain surgical syndromes which may be caused by tropical fevers and tropical internal diseases chiefly malaria and amoebic dysentery I propose also giving a short account of «be oar» and briefly treat the subject of animal bites about which so little is found in medical and surgical textbooks

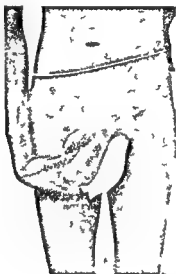
ENDEMIC FUNICULITIS

For many years men practising in Ceylon noticed the occurrence of a peculiar form of acute suppurative inflammation of the spermatic cord which occasionally took a true epidemic character numerous cases occurring within a short period References to this affection may be found in all the medical reports for the colony the disease being variously indicated by the name of phlebitis of the cord or corditis It was considered by some to be of traumatic origin by others of venereal origin Some practitioners considered it to be a malarial affection The disease was investigated by me in 1907 I came to the conclusion that it had nothing to do with either malaria or gonorrhoea I thought the condition had sufficiently characteristic symptoms to be ranked as a separate disease or at least syndrome and suggested the name endemic funiculitis The affection is not limited to Ceylon as cases occur in Southern India and an identical pathological condition has been described in Egypt by Madden under the name of cellulitis of the spermatic cord The condition described by Wise in the West Indies is probably the same pathological entity Of great importance are the investigations by Coutts Cases have occurred in Kenya and other regions of Africa

Morbid Anatomy — At the post mortem examination of the cases in which an operation has not been performed in time the lesions found are those of a septicaemic process The skin is jaundiced

and may present petechiae the lungs often show hypostatic congestion the heart is flabby and subpericardial haemorrhages are often seen The spleen is enlarged and soft The liver is generally enlarged and may show fatty degeneration or cloudy swelling The kidneys are often congested

Etiology — The condition is due in all probability to a streptococcal infection engrafted on filariasis although there are some cases



Case of endemic funiculosis (Ceylon)

which seem to be of purely bacterial origin and in which the filarial infestation can be excluded with certainty

Among Ceylon practitioners the disease was considered by some to be of traumatic origin others believed it to be of venereal origin and yet others to be a malarial manifestation. I found in all the Ceylon cases virulent diplo-streptococci indistinguishable from the ordinary streptococcus but for the fact that while gram negative in the pus some were Gram positive in the cultures. According to Coutts the streptococci which are discoloured by Gram in sections of the tissues and in smears from the pus are often found in the urethra of the natives. He regards the

suppurative condition of the cord as due to the extension of an infection from the urethra by way of the vas deferens. In about 30 per cent of my cases microfilariae of the type bancrofti were present. It is possible that the filaria plays the more important or only role in the subacute or chronic cases while the streptococci are the cause of the acute symptoms and the suppuration and the septicaemia.

Symptomatology — The disease begins suddenly generally after a hard day's work or severe exercise. In Ceylon the usual history is as follows. The patient after an extra hard day's work comes home



Funiculus in a case of endemic funiculitis. Note large openings of the dilated veins which were filled with pus. The testis and epididymis were normal but the tunica vaginalis contained a small quantity of fluid.

in the evening very tired but not feeling unwell and takes a cold bath as usual. After the bath he is suddenly seized with a shivering fit, the temperature rising very high. He feels very sick and there is often actual vomiting. At the same time he complains of pain along the cord and epididymis. The condition becomes rapidly worse and the patient is generally taken to hospital on the second or third day of the illness. On admission it is usually found that the general con-

dition is grave. There may be continuous vomiting and occasionally hiccough. The temperature is generally about 102 F and the pulse small and frequent. At the physical examination it will be seen that the inguinal region is occupied by a large cylindrical swelling in the direction of the cord. The swelling is very tender on pressure and hard, the skin is not affected. Generally the epididymis is somewhat enlarged and tender, though in some very recent cases it may not appear to be affected. In all cases the testicle proper appears to be normal, there is as a rule little or no effusion in the tunica vaginalis. The affection is generally localized to one side only, but occasionally attacks both sides. On examination of the penis and scrotum no ulcers are found, no signs of gonorrhea and no signs of any traumatic lesions, though in several cases the patient gives a history of having made an effort of some sort. As a rule the disease has no tendency to spontaneous recovery. If an operation is not performed in time, signs of general septicaemia usually set in. In such cases the skin of the patient often becomes jaundiced, cutaneous haemorrhages may appear, the fever is of an intermitteⁿt or remittent type, the pulse becomes extremely small, there is often hiccough and the patient dies in a few days.

Varieties — A mild form with thrombosis of the veins but without suppuration is at times met with. According to Cou^tts a chronic form also without suppuration may occur.

Prognosis — This is serious in the ordinary acute form. If an operation is not performed in time, symptoms of general septicaemia set in and the case, as a rule, ends fatally.

Diagnosis — The disease is apt to be confused with strangulated hernia or an acute elephantoid condition of the testicle and cord. From the former, endemic funiculitis may be differentiated by the history, the high fever and the course, which is somewhat less acute. In some cases, especially in the fulminating forms, operative treatment alone will clear the diagnosis.

From an acute elephantoid condition it may be differentiated by the absence of the erysipelato^us like redness of the skin.

Treatment — Except in the rare mild forms when lead lotion and ichthyol ointment with or without ice applications may be sufficient the only effective treatment is surgical and *orchiotomy* with section of the inflamed cord as high up as possible is imperative. Coutts recommends exposure of the inflamed cord by a free incision through the skin and external oblique to be followed by numerous incisions into the tumour. The wound is left open and fomentations applied till the surface is clean. The wound is then left to heal by granulation. Coutts considers that in this way though the testis loses its generative function its internal secretion is unimpaired.

When the disease has extended beyond the internal abdominal ring orchiotomy must be performed and the veins left unligatured while fomentations are applied.

Sulphonamides penicillin and other antibiotics seem to be useful but usually are not sufficient to induce a complete cure and prevent an operation.

APPENDICULAR SYNDROME OF MALARIAL ORIGIN

Surgeons who do not live in an intensely malarious place will hardly believe that malaria may give rise to syndromes closely resembling surgical diseases. One such syndrome which is not very rare is the appendicular syndrome. The patient suddenly complains of severe pain in the lower right abdominal quadrant he has high fever he vomits. The physical examination reveals extreme tenderness and resistance in the appendicular region. The pulse is frequent and small. These cases not rarely are operated on and practically nothing is found excepting perhaps a slight congestion of the appendix and the caecum. The appendix never contains pus. If it is sectioned and smears made from it in some cases numerous malaria parasites are found in the enlarged capillaries. The correct diagnosis is usually suggested by the enlargement of the spleen presence of malaria parasites in the peripheral blood prompt response to quinine and other antimalarial drugs given in large doses at times by intramuscular or intravenous injection.

APPENDICULAR SYNDROME OF AMOEBIC ORIGIN

I have seen quite a number of cases of appendicitis operated on although the condition was of amoebic origin. The correct diagnosis is suggested by the patient giving a long history of intestinal disturbance before the attack of appendicitis by the liver being often enlarged by the presence of *Entamoeba histolytica* cysts in the faeces by the extremely rapid response to emetine. In a fairly large number of cases of chronic subclinical amoebiasis presence is noted of one two or three of the so called Castellani's signs: subcostiform tender spot, zone of dullness at the right base, liver dullness high on the middle axillary line, normal on the mammillary line. Description of these signs, none of which of course is pathognomonic, may be found at page 1901.

MALIGNANT TUMOUR SYNDROME OF AMOEBIC ORIGIN

The patient for months feels discomfort and at times pain in the region of the sigma and passes several small motions daily consisting of blood and mucus. After a time on palpitation one feels a tumour like mass in the sigmoid region and the X ray examination after a barium enema shows signs of stricture. In these cases the surgeon is apt to make a diagnosis of malignancy of the sigma and advises an operation. Before doing so the examination of the stools for cysts should be carried out many times and the emetine therapeutic test should be tried to exclude the tumour being in reality an amoeboma.

BEZOAR

Recently my advice was sought by a young colleague regarding a case under his care who had been suffering from obscure dyspeptic symptoms for years. From time to time the patient was vomiting and in the vomited matter on several occasions hair had been found. Hair was found also occasionally in the faeces. It turned out to be a typical case of «bezoar» (trichobezoar).

The term *bezoar* is of Persian origin being derived from the word *bad-e-hr* and for centuries it was applied to indicate the free ball like masses of concretions of various types found in the stomach or intestines of animals especially horses cows and cats In the middle ages valuable curative properties were ascribed to them The condition is found also in man The term *trichobezoar* is used when the bodies consist of hair the term *phytobezoar* when the condition is of vegetal origin and the term *mycobezoar* when it is of mycotic origin The last may be considered a variety of *phytobezoar*

As stated this term indicates that the masses or balls inside the gastric cavity are composed of hair *Trichobezoar* is not very rare in horses cows and cats Baulamant in 1779 (*Journal de Médecine et Chirurgie* vol 52 p 507 1779) gave a good description of the condition as observed in man and Schoenborn performed the first operation for such a condition in 1883 In more recent years valuable studies have been on the subject by I J Davies (*Lancet* Oct 15 p 791 1921) Maes (*Ann Surg* vol 88 p 685 1928) Thorek and Rutter (*Am Journ of Surg* March 1937 p 603) Matas paper is especially important (*Trans Surg Gynecol and Obst* vol 21 p 594 1915)

Etiology — The condition is usually found in nervous or hysterical individuals generally young women who have got into the habit of biting and swallowing hair It may be found in persons who on account of their work are handling hair continuously such as wig makers who may swallow bits of hair floating about or hairs they hold in their mouth in the course of their work

Symptomatology — For years the patient may have no symptoms whatever except occasionally some slight dyspepsia Later in the majority of cases there is gastric pain vomiting constipation bad breath and severe symptoms of acute obstruction may develop requiring an immediate operation

Diagnosis — Some cases may be suspected on the history which can be elicited from the patient and from his occupation It may be made with certainty when portions of the bezoar are vomited they are seldom passed with the stools The X ray examination is most

important as it puts in evidence as a rule a mass or several masses lying free in the gastric cavity surrounded by the opaque barium meal which outlines and coats them and radiosopic palpation demonstrates the masses to be freely movable within the stomach

Treatment — The treatment is surgical gastrotomy and removal of the ball like masses

PHYTOBEZOAR

This term is used to denote a bezoar of vegetable origin. It is found occasionally in persons who for years have a diet consisting chiefly of fruit vegetables coarse bread and who use much bran. An interesting case has been reported by Thorek and Rutter of a phytobezoar in a woman who for five years had been on a diet composed practically entirely of persimmons and other fresh fruits cereals and whole wheat bread. The X ray examination after a barium meal revealed two masses rather widely separated coated with barium lying free in the stomach. Gastrectomy was performed and two large soft emerald green foreign bodies were removed. On sectioning it was found that they consisted of portions of persimmons and many vegetable and plant fibres.

MYCOBEZOAR AND FUNGAL GROWTHS IN THE STOMACH

The presence of fungal elements in the stomach contents is quite common the organisms being introduced with the food. Occasionally the fungi actually multiply on the mucosa — usually without penetrating it — forming pseudo membranes casts and rarely ball like masses. When the mycotic masses are large and ball like they are considered bezoars (mycobezoars) and included by some authors among the phytobezoars (*vide supra*). The commonest variety of the condition is gastric thrush due to yeast like fungi of the genus *Candida* and characterized by the presence of white patches on the mucosa it may extend to the intestine. A case has been described by J. T. Duncan and F. Murgatroyd in which a fungoid cast of the

stomach of a white colour produced by a *Fusarium* sp was vomited (Trans Roy Soc Trop Med vol 31 N° 5 1938)

The symptomatology of the fungoid growths in the stomach is not characteristic. The symptoms unless the mycotic infection is secondary to carcinoma or some other serious condition of the organ are mild the patient complaining merely of slight discomfort in the epigastric region rather than pain. Occasionally eructation is a pronounced symptom.

The diagnosis can be made only when portions of the fungal growth appear in the vomit or in the material obtained by the gastric tube. The microscopical examination will show the membranes or masses to be composed of yeast like cells and mycelial filaments.

An alkaline treatment may be prescribed in cases of gastric thrush as it has often a mycostatic action on candida fungi. If it fails basic fuchsine may be given in cachets or soft gelatinous capsules or friable pills each containing grm 0.15-0.20 of the drug one dose three or four times daily for periods of 3 or 4 days at a time. Basic fuchsin given in the above dosage does not cause any obnoxious symptom but the urine often becomes pinkish.

I may say *en passant* that I first introduced basic fuchsin in the abortive treatment of cholera — in the very first stage before vomiting begins — many years ago grm 0.20 every 15 minutes or grm 0.10 every ten minutes until a total of grm 1.60-2.00 has been administered. The rationale of it is this in cholera diarrhoea appears before the vomiting and the administration of fuchsin at the very beginning of the diseases is therefore possible. The fuchsin quickly reaches the small intestine and apparently kills the vibrios by fixing and staining them and therefore their endotoxin is not liberated. Readers interested in the subject might consult my paper «Breve nota sul trattamento del colera con la fucsina» (Rivista Istituto Sieroterapico Italiano (Napoli) Vol 23 N° 2 pag 74 1948) in which certain experimental investigations are reported which I carried out with the valuable assistance of Iacono, Servino and Zanelli.

ANIMAL BITES

(Bites, maulings and other traumatism inflicted by wild
and domestic animals)

The subject of bites and maulings inflicted by animals is of importance especially in tropical countries but little information on it is found in the ordinary medical and surgical text books.

Bites and maulings of wild and domestic animals are quite common in India and Tropical Africa. According to official returns in India in 1925 wild beasts caused 1974 deaths of which 974 were accounted for by tigers while the rest were assigned mostly to wolves, bears, leopards, elephants and wild pigs. In 1926 the total number of persons killed by wild animals in British India amounted to 1987. Tigers were responsible for 875 deaths, leopards 185, wolves 167, bears 96, elephants 58, and hyenas 15. Of the 393 deaths from other animals 41 were assigned to wild pigs and 151 to crocodiles.

Statistics for later years are not available as they are no longer quoted in the annual reports of the Public Health Authorities.

I make a distinction between the physical injury caused by the bite of one of the larger animals and the chemical injury caused by a venomous animal. I do this advisedly while recognizing of course that the former may introduce germs, viruses and toxins into the wounds so produced.

BITES, MAULINGS AND OTHER INJURIES INFLICTED BY THE LARGER CARNIVORA

I refer especially to the injuries inflicted by the bites, rends and scratches produced by the teeth and claws of species belonging to the families *Felidae* and *Ursidae*.

In the *Felidae* are *Felis leo* Linnaeus whose habitat is in Africa, *F. tigris* Linnaeus habitat Asia, *F. Pardus* Linnaeus habitat India, *F. leopardus* Linnaeus habitat Africa, *F. onca* Linnaeus habitat South America, *F. pardalis* Linnaeus habitat South America. These cats

have the dental formula $\frac{3}{3} \frac{1}{1} \frac{3}{2} \frac{1}{1}$ giving thirty teeth for the whole mouth which includes the most perfect types of carnassial teeth capable of producing exceedingly severe lacerations. These animals feed not merely on fresh prey which they have recently slain but also on its body for a day or so after its death.

Their maws and claws therefore become foul being infected with microorganisms and their toxins and hence the great danger of

septic intoxication and infection which markedly increases the gravity of the injuries inflicted

The other family *Ursidae* includes the bears which are found in India and Ceylon = *g Ursus torquatus* of the Himalayas and *U malayanus* Their dental formula is $\frac{3}{3} \frac{1}{1} \frac{4}{4} \frac{2}{2} =$ forty two teeth in

the mouth but these do not include carnassial teeth which added to the facts that they are not as a rule such foul feeders and often eat vegetal foods causes their bites to be not quite so serious from a septic point of view as those of the *Felidae*

Their claws however may produce most serious effects of both a traumatic and of a septic nature The importance of the septicity of these wounds has been well appreciated from earliest times for in the fifth book of his «De Medicine» Celsus remarks with regard to the bites of ferocious animals and also of dogs apes and man «Omnis autem fere morsus habet quoddam virus»

It is of course possible for any person of any age and either sex to be the victims of wounds inflicted by these animals but the persons most frequently injured are hunters (shikaris) and sportsmen while the district postmen in jungle regions run great risk as do shepherds and to a less extent herdsmen and to a still less extent cultivators and villagers living in lonely places or in the bush or jungle Years ago with my friends A J Chalmers Geo Low and D Christy I had the experience of encountering wild animals under unexpected circumstances during journeys into the interior of Africa but the risk which an ordinary traveller with his gang of porters runs is relatively small particularly if he has some slight knowledge of the habits of these animals The most dangerous regions to travel through = tall grass as the hunter or traveller and the wild beast may meet suddenly and it is here that an accident is more likely to occur than in open scrub country Another prevalent cause of accidents is the beating by means of men on foot of jungle or bush into which a wounded animal has retreated The especially dangerous animal under such circumstances in India is the tiger and long ago Sir Samuel Baker especially drew attention to this fact and recommended that if no elephants are available then a herd of buffaloes should be driven through the jungle as they will quickly dislodge the tiger The

possible presence in the vicinity of the mate of the wounded animal should always be borne in mind as the omission to remember this simple fact has often led to grave accidents



Bite of Hyena (Scarring)

Symptomatology — The physical signs and symptoms produced by these bites and mauls may be divided into general and local. With regard to the former immediately after being bitten or mauled the victim if able to stand feels giddy and turns pale becomes unable to stand and if the injuries are at all severe quickly passes into a

condition of shock with a weak pulse cold extremities pinched drawn face and weak voice and may become insensible which indeed is often his condition when first rescued in the severer cases As a rule he remains in a more or less torpid condition sleeping day and night and suffering severely when roused from thirst and pain All these symptoms are more accentuated in Europeans than in natives

Usually reaction sets in fairly quickly the temperature rising to 101 to 102 F or even more while the pulse is generally quick ranging about 110 to 120 beats per minute Generally the torpor continues for some time but delirium may intervene The mouth and throat continue to be dry and thirst is still a marked symptom Locally the injured region may show rends and tears in the skin lacerations of the muscles tendons exposed and torn vessels and nerves injured with more or less haemorrhage bones may be exposed bruised broken or dislocated joints may be exposed opened and injured Around the injured regions the parts are bluish or red in colour and swollen and quickly become oedematous firm and hot to the touch

If the wounds are but slight the inflammation may remain superficial but usually the great danger is a cellulitis associated with pus formation and intermittent fever A more serious complication is spreading or acute traumatic gangrene Later as the patient recovers there is the liability of sinus formation and of stiffness in the joints and disfiguring scars

It is important to remember that malaria may occur as a complication and that therefore some of the intermittent temperature may at times be due to this cause

There is no difficulty with regard to the diagnosis as a rule as there is generally a history to be obtained while the local signs are sufficiently indicative of the condition but the prognosis with regard to even slight wounds must at first be guarded especially in Europeans as it is impossible to foretell how serious the intercurrent septic infection may prove to be although the introduction of the sulpho namide drugs and of the antibiotics have made matters much less serious The treatment resolves itself into two distinct categories first the first aid when the rescue is affected and secondly the usual surgical treatment

With regard to the first aid the usual methods for arresting haemorrhage combating shock and carrying the victim are too well known to require repetition but the thorough washing of the wound with water even jungle water would appear preferable to leaving the poison from the animals teeth and claws in the wound. A small first aid surgical case containing antiseptics bandages etc. and also sulphonamide tablets and antibiotics should form part of the outfit of every sportsman but unfortunately is often forgotten when actually going shooting.

As a rule the haemorrhage has more or less abated by the time the man reaches hospital but any possible source of bleeding must at once be attended to and an injection of penicillin given immediately and the wound thoroughly washed and syringed with warm permanganate (1/2000) or iodine lotion (one teaspoonful of tincture to a pint of water) or acriflavine (1/1000) or some chlorine antiseptic. Pieces of dead or sloughing tissue may be removed but it is better to defer any serious operative treatment for twenty four hours if possible as it is very dangerous to perform anything of this nature in the condition of shock usually exhibited by the patient. Blood transfusions may save life. The parts may be drawn together by a suture if necessary but very few of these should be inserted and as free drainage as possible allowed. Repeated and carefully applied antiseptic dressings must be carried out. In the past it was always recommended to administer antitetanic serum but it is much simpler to institute at once a penicillin treatment and in this way to combat many infections including tetanus.

As soon as there is any suspicion that cellulitis may have supervened free incisions must be made and hot antiseptic baths and hot fomentations must be applied.

Amputation is at times necessary if spreading traumatic gangrene supervenes when it must be performed as high up the limb as reasonable as it is useless to do repeated operations first at low and then at higher levels while all the time the disease is spreading. Sinuses require to be scraped and plugged with antiseptic gauze and Bipp or Zipp paste is at times useful. Amputation however is really seldom necessary if antigangrene serum and antibiotics are available and given in large amounts.

When recovery is proceeding and the septic infections have ceased plastic operations are necessary to close the large wounds left by the destruction of the tissues while massage and douches may be required to prevent joints from becoming stiff

As regards the general measures the first requirement of the patient is usually plenty of water to drink to relieve the urgent thirst from which he suffers and to dilute the toxins of the possible intoxications

At first food should be of the lightest description — broths soups and milk diet — and later the ordinary hospital diets may be gradually introduced

With regard to *prophylaxis* the natives adopt simple protective remedies such as a bell and spear or a stick and small arrow the latter being in use in districts infested by the small bear For a sportsman it is important to thoroughly understand the habits of the ferocious creatures which he is hunting and especially to know what they usually do when wounded

In travelling in the African bush a zareba with a fire is usually a good protective during the night

BITES AND OTHER TRAUMATISMS INFLICTED BY THE SMALLER CARNIVORA

Under this heading come the traumatisms caused by members of the family *Canidae* of which *Canis lupus* Linnaeus the wolf *C. aureus* the jackal and *C. familiaris* the dog may be quoted

Their general dental formula is $\frac{3 \ 1 \ 4 \ 3}{3 \ 1 \ 4 \ 2} =$ forty two teeth A wolf

bite resembles that of the larger carnivora while the jackal generally attacks children inflicting severe wounds often of a septic nature The jackal is often infected with hydrophobia which he spreads to the village dogs and in this way the disease is at times kept up in tropical countries

BITES AND OTHER TRAUMATISMS INFLICTED
BY THE UNGULATA

Among the Herbivora there are two families which are celebrated for vicious attacks upon man and these are the *Camelidae* and *Bovidae*.

Camelus bactrianus Linnaeus may at times have a bad temper and it is often dangerous for a stranger to approach a camel for its



Bite of a Camel

bite is as a rule a serious injury the deep tissues being crushed and lacerated while the bones may be crushed broken or dislocated and the tendons bursae and joints may be laid bare or opened and last but by no means least because of the possibility of gangrene and

severe septic infection. The bites generally occur on the upper or lower limbs but are also known on the head and face. The shock from such severe injuries is naturally very great but the symptoms, signs and treatment resemble those already mentioned under the heading of traumatism caused by the Carnivora and need not be repeated.

Among the Bovidae the buffalo is very dangerous — e. g. *Bufalus indicus* in India and Ceylon and *Bufalus brachyceros* in Central Africa — the danger being deep penetrating wounds of the limb, chest or abdomen as well as severe punctured, lacerated and contused wounds in any part of the body.

Here attention may be drawn to the fact horses may become affected with hydrophobia which is a serious danger. The animal appears to be in great pain and is often thought to have colic; it froths at the mouth and becomes very savage, biting articles in its stable and kicking the wall in a furious manner until weakness sets in.

Kicks may produce serious contusions and wounds as well as injuries to internal organs.

The Rhinoceri — *Rhinoceros indicus*, *R. javanicus*, *R. sumatrensis*, *R. africanus* produce most serious punctured and lacerated wounds.

Hippopotami are common in the rivers and lakes of Africa — e. g. *Hippopotamus amphibius* and *H. liberiensis*. As a rule they are quite peaceful animals when left alone but once attacked they become dangerous, seizing the boat or persons in their huge jaws and crushing wood or flesh and bones into shapeless masses. They are very courageous and nothing but death will stop the charge of one of these brutes. They will quickly stamp the life out of any victim they catch on land.

The Suidae or pigs are commonly met with in tropical jungles and are of importance because of the way they eat the remains of persons who have been lost in the jungle. All the soft parts are completely destroyed while the bones are broken so that it is impossible to say whether the unfortunate people died or were killed, whether they met with an accident or simply lost their way, whether the pigs ate them while dying or only after death.

Severe lacerated wounds can be inflicted by the tusks of an enraged boar.

PROBOSCIDEÆ — The elephants — *Elephantus africanus* and *E. indicus* — usually kill their victim by stamping on him until the soft parts are terribly crushed lacerated and bruised while bones are broken. They also seize people by means of their trunk and lash them against surrounding objects or on the ground.

BITES AND OTHER TRAUMATISMS INFLICTED BY THE LARGER REPTILIA

The crocodiles, gavials and alligators are a constant source of danger in the tropics especially to natives while bathing in rivers. The name crocodile and alligator are often used as though they were synonyms but this is not so. Some twelve species of crocodile are well known. They possess a formidable array of teeth expressed as a rule by the formula $\frac{18}{15}$ of which the third and ninth in the

upper jaw are longer than the others and are respectively lodged between the second and third and the eighth and ninth teeth in the lower jaw in which the first fourth and eleventh teeth are the strongest. The muzzle of the crocodile is longer than that of the alligator. The muzzle of the alligator is relatively short and broad.

The muzzle of the gavial is very long. The two species of importance are *Gavialis schlegelii* of Java and Borneo and *G. gangeticus* of Ganges. The latter has a dental formula of $\frac{28}{25} \frac{29}{26}$ teeth.

The following list modified from Blinn gives the names and habitats of these formidable reptiles —

A. Snout extremely long and slender —

Gavialis gangeticus India *Tomistoma schlegelii* Borneo and Sumatra

B. Snout very sharp slender and triangular —

Crocodylus atapha West Africa *C. johnstoni* Austral. *C. notostomus* Orinoco

C. Snout moderately sharp and triangular —

Crocodylus americanus Mexico Central and South America *C. siamensis* Siam and Java *C. melnotus* Africa *C. porosus* India and Malaysia

D Snout oval bluntly triangular —

Crocodylus robustus Madagascar *C thomasi* Cuba *C moreletii* Guate
male and Honduras

E Snout broad and short —

Crocodylus palustris India and Malaysia *Osteolaemus tetraspis* West Africa

F Canine teeth of lower jaw fit into a pit in the upper jaw

I Snout as in D *Caiman trigonatus* Upper Amazon *C sclerops* Central
and Southern America *C palpeosus* Tropical South America II Snout
very broad and rounded *C lateralis* Tropical South America *C niger*
Tropical South America *Alligator mississippiensis* U S A *A sinensis* China

The celebrated man eating species are —

Crocodylus niloticus the Nile crocodile *C. porosus* the salt water crocodile

The American species are said to be inoffensive as there are no records of
attacks upon man

An important anatomical feature of these reptiles is the length
and strength of the tail by means of which they can strike a man
standing on the low bank of a river such a powerful blow that he may
be knocked into the water

Accidents are commonly met with while people are crossing
streams or bathing therein while women are washing clothes or
filling vessel with water at the river or lake On the Victoria Nyanza
Lake such accidents were quite common Anyone sitting on a steamer
or other craft on a lake with his feet hanging over the side or leaning
over with his hands in the water simply provides bait for any croco-
dile in the vicinity

As a rule if the victim is rescued it is found that a portion of a
limb has been bitten off but Chalmers and myself observed a case
long ago in which only a large portion of the pectoralis major was
removed In this case the victim attributed his escape to driving his
thumbs into the crocodile eyes The wound healed excellently though
of course there was practically no pectoralis left on the side in ques-
tion and in its place was an area of scar tissue Crocodile bites are
not nearly so liable to septic infection as the bites of the Carnivora

BITES AND OTHER TRAUMATISMS INFLICTED BY THE NON POISONOUS SNAKES

Although rarely boas and pythons which are non poisonous and which kill their prey by constriction may attack and crush human beings who accidentally come into contact with them. They may also bite but their bites cause only traumatic lesions. Most boas are generally of gentle disposition and some of them may easily be domesticated they generally hunt rats and other small animals. Pythons are much more ill tempered. Both groups of snakes belong to the subfamily *Boidae*. The boas have no teeth in the premaxilla and super orbital bones while the pythons have a few teeth in the premaxilla and possess a pair of super orbital bones.

BITES AND OTHER TRAUMATISMS INFLICTED BY SHARKS AND LARGER SELACHII IN GENERAL

By far the greatest number of sharks live in the seas of warm climates and are well known because of the danger of their bite which is often fatal. The greatest risk is to bathers and fishermen but it is a curious fact that the divers for pearls appear to incur little risk. This was noted by Chalmers and myself many years ago when pearl fisheries were held in Ceylon. It is probable that the noise of the large number of people employed in this work frightens the sharks which keep away.

Carcharias gangeticus was for a number of years a source of great danger to the crowds at the bathing ghats of Calcutta. According to Sir Joseph Fayrer they used to feed upon the partially burned bodies which were formerly thrown into the river but when this custom was discontinued they began to attack people at the bathing ghats especially in the months of April and May when the river contains much salt water. He says that they would dash into the crowd at the bathing ghat and inflict dangerous and ~~and~~ at times mortal wounds though they seldom were able to get away their victim because of the numerous people at the ghat.

The patient is brought to the hospital suffering from the effects of shock and haemorrhage with a limb either snapped off or partially torn off or with larger or smaller lacerated wounds in which the bones may or may not be exposed and grooved by the sharks teeth and the blood dripping from the ragged surface of the wound. Usually the patient is in a state of extreme prostration covered with a cold sweat having a hardly perceptible pulse.

More rarely there are only a few triangular or irregular lacerated wounds showing that the shark did not obtain a proper hold of the victim.

The great immediate danger is death from shock or haemorrhage. If this is avoided the wounds appear to heal readily but at times amputation is necessary. Although as a rule there is very little tendency to sepsis penicillin and other antibiotics and sulphonamide drugs should be administered.

Sharks abound in the sea along the coast of French British and Italian Somaliland. There is a general belief in those regions that they will attack Europeans but very seldom natives.

HUMAN BITES

These are not at all rare especially among African natives both men and women being inflicted during personal and family quarrels. The bites inflicted by the Kru men on the West Coast of Africa in quarrels were of not uncommon occurrence and it was also fairly common to meet with injuries on the knuckles caused by scratches from their teeth.

These wounds were usually considered to be serious for although the teeth of the African appear to be in excellent condition of repair and cleanliness a bite often causes severe septic inflammation.

Some years ago Maes in Louisiana investigated the severe injuries produced by human bites. In several of his cases there was present a spirochaetic infection and the wounds had a tendency to become gangrenous.

Among the negroes in Louisiana especially dreaded are the bites given by members of their race whose gums have a bluish tinge

Lowrie has emphasized the fact that while a human bite frequently gives rise to very serious local and generalized infection tetanus never develops.

Tincture of iodine should be applied locally as soon as possible after the bite or a strong solution of potassium permanganate 1.5 per cent or Castellani's fuchsin paint. Lowrie recommends cauterization with fuming nitric acid immediately followed by a flushing with cold water but this treatment is very painful and not really necessary. If the patient is seen some time after the injury then the best local treatment is by fomentations with carbolic acid 1 per cent or a mercury perchloride lotion 1:2000. In every case penicillin should be given in large amounts. Aureomycin, chloromycetin and terramycin may also be given with good results.

7 LITTLE KNOWN TROPICAL SKIN DISEASES

Any number of little known skin diseases are found in the tropics and subtropics. I will discuss some of them without attempting a proper classification but merely separating them into four groups: 1) of bacterial and spirochaetic origin; 2) of mycotic origin; 3) of parasitic origin (animal); 4) miscellaneous usually of unknown or doubtful origin.

DERMATOSES OF BACTERIAL ORIGIN TROPICAL PYODERMATA

Following the majority of authors I use the term pyoderma as a collective term to indicate any superficial purulent or ulcerative affection of the skin due to cocci of the genera *Micrococcus* (*Micrococcus pyogenes* var. *aureus* and var. *albus* usually known as *Staphylococci*) and *Streptococcus*. The pyodermata found in the tropics may be separated into two groups:

- 1) The tropical pyodermata
- 2) The cosmopolitan pyodermata

Tropical Pyodermata — The chief ones are

- 1) Pyosis mansonii (Pyoderma mansonii)
- 2) Pyosis nodularis tropica (Pyoderma nodulare tropicale)
- 3) Pyosis cupuliformis (Pyoderma cupuliforme)
- 4) Pyosis follicularis crurum (Pyoderma folliculare crurum)
- 5) Microvesiculosis sparsa cutis glabrae (Pyoderma microvesiculosum)

The tropical pyodermata may occasionally be observed also in the temperate zone

The chief cosmopolitan pyodermata are

- 1) Impetigo
- 2) Ecthyma

I will briefly discuss only the tropical ones

PYOSIS MANSONI

This disease was described by Patrick Manson in the late seventies of the last century. He called it Pempfigus contagiosus tropicalis. The disease of course has nothing to do with pemphigus, being much more closely allied to impetigo. Geographically it is found all over the tropics, especially in those parts of the tropics which have a hot damp climate such as Ceylon, Malaya and Indochina. I have occasionally seen cases in countries situated in the Temperate Zone during the summer months — e. g. Louisiana and South Italy and Portugal.

Etiology — For many years there was much discussion on the etiology of the disease. Some authors believed it to be due to *Staphylococcus aureus*, others to *Staphylococcus albus*. Some observers considered the eruption to be caused by a diphtheria like bacillus and a few authors believed the disease to be of leishmanic origin. In 1924 in India J. Cunningham, J. S. Ramakrishnan found that in the inci-

piant lesions a streptococcus was present with cultures of which it was possible to reproduce the malady The role of *haemolytic streptococci* of Lancefield's group A has been emphasized in recent years

Symptomatology — In a typical case in both the axillary regions a number of vesicles and bullae are seen The bullae are of rather large size — from a large pea to a large bean The bullae are mostly dome like and their contents are clear Each bulla is surrounded by



Pyosis mansonii

a very narrow zone of erythema The intervening skin between the bullae is normal The eruption does not spread to the face occasionally it may spread to the groins and very occasionally to the chest crusting is practically never noticed

A full clinical description may be found in Castellani & Chalmers Manual of Tropical Medicine London 1919 pag 2018

Treatment — In the old days it was very difficult I remember in Ceylon having had cases where nothing would do any good The

only successful measure was to send the patient to the mountains two or three days after being in a cool climate the eruption would disappear. At present the treatment is quite easy the disease answering rapidly to sulphonamides and penicillin. In rare cases not answering to this medication a streptococcus vaccine prepared with the streptococcus isolated from the patient or other cases of the disease induces a rapid cure. An external application which is very useful and which I have used for years is the following: Xeroform or dermatol grm 2 boric acid grm 2 glycerine grm 1 alcohol grm 5 aqua dest grm 100. Shake before using.

PYODERMMA NODULARE TROPICALE
(PYOSIS NODULO CRUSTOSA TROPICALIS)

(Pyosis nodularis tropica Pseudo-Framboesia Castellani's pyosis)

This disease is known in Ceylon as «Kurunegala Nodules» or «Kurunegala Ulcer» as it is extremely common in the Kurunegala district. The first impression on seeing one of these patients is that he is suffering from yaws. The whole body is covered with nodular crusty lesions. On removing the crusts nodules are seen the size of a pea or bean. The nodules however are quite different from true yaws nodules they have a smooth surface while the nodules of yaws have a granular or vegetating surface. Moreover in the nodules of pyosis tropica no spirochaetes are found and the Wassermann test is negative. The treatment used to be very difficult. Penicillin and sulphonamides give good results.

A full description of this disease is given in Castellani & Chalmers Manual of Tropical Medicine London 1919 pag 2021.

DERMATITIS CUPOLIFORMIS

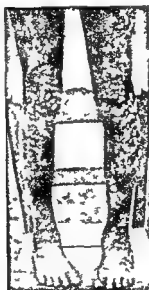
(Pyoderma cupoliforme)

Historical — This disease was first described by me in 1914 as seen mostly in Europeans in Ceylon. Subsequently I observed cases in the Balkans.

Climatology — So far it has only been reported in Ceylon and in the Balkans

Etiology — It is caused by a streptococcus which I named *S. tropicalis* (See Castellani & Chalmers Manual of Tropical Medicine 3rd edition 1919 London pag 2034)

Symptomatology — The disease begins as superficial dusky red follicular slightly itching macules on the feet and legs. Some of these



Pyosis nodulo crustosa tropicalis

spots disappear while others become slowly raised, hard, infiltrated and cupuliform, reaching the size of a pea or a very small cherry. After a time the centre of the nodules breaks down and forms an ulcer with a reddish floor and undermined edges.

These ulcers are somewhat painful and very slow to heal, and when this does take place it produces patches of hyperpigmentation.

The course of the disease is very long lasting at times more than a year

Diagnosis — The characteristic features of the eruption are the presence of raised hard rather large cupoliform nodules some of which show a central ulcer with undermined edges

The differential diagnosis has to be made from *Oriental sore* by the absence of Leishman Donovan bodies

From *ecthyma* it may be distinguished by the absence or rarity of pustular lesions In *ecthyma* the initial lesions are always pustular



Pyoderma cupoliforme

consisting generally of discrete flat pustules when these rupture a brownish crust is formed beneath which suppuration goes on In the condition known as «*ecthyma gangrenosum*» occasionally developing after varicella and other exanthemata the initial lesions are vesicular or pustular and no nodules are present

In *pyosis nodularis* the ulcers do not show undermined edges and pustular lesions are present

In *purulent folliculitis* of the legs there are no ulcers only pustules pierced by hairs being present

Prognosis — The condition runs a very long course and in some cases is difficult to cure

Treatment — In the past this was difficult the only satisfactory therapeutic method being by an autogenous vaccine. At present penicillin and other antibiotics give good results.

PYOSIS FOLLICULARIS CRURUM

(Tropical Impetigo Bockhart)

On the legs and thighs numerous pustules are seen each transfixes by a hair. The eruption is very chronic and very stubborn.



Pyosis follicularis crurum (Tropical impetigo Bockhart)

and may last for years. After about a year the hair on the legs falls out and is not replaced. The skin of the legs takes on a peculiar parchment-like appearance becoming smooth and somewhat lucent as if it were glazed. The disease resembles Bockhart's impetigo of temperate climates but is much more serious and may continue for years.

Treatment — Sulphonamides, penicillin and other antibiotics are useful but the condition does not answer to this medication as quickly

as other pyodermata *Local treatment* consists in epilation followed by the application of a *disinfecting lotion* or an ointment such as the following carbolic acid beta naphthol salicylic acid ana grm 0.30 vaseline grm 30

MICROVESICULOSIS SPARSA CUTIS GLABRAE

This condition described by me recently can hardly be called a disease. The patient suddenly feels a slight pain — for instance



Microvesiculosis sparsa cutis glabrae

in the right arm. At the spot where the pain has been felt shortly after a minute vesicle appears which may be follicular transfixed by a lanugo hair or non follicular surrounded by a very small hyperaemic halo. The size of the vesicle varies from a pin point to a pinhead. The contents are at first clear — later they become turbid and then the vesicle or vesiculo pustule on a dark skin appears as a minute white opaque perlacious tiny spot. One or two weeks

later the patient again feels a slight pain usually on the other arm and a few hours later a minute vesicle appears identical to the first one. This process goes on until perhaps ten or twelve or twenty vesicles are present on the whole body. They are widely scattered each vesicle being situated at a great distance from the other. The bacteriological examination shows presence of *Staphylococcus albus* never of *Staphylococcus aureus* or of streptococci.

Histologically the vesicle is situated in the horny layer and contains a few lymphocytes and later some polymorphonuclears and some Gram positive cocci.

With regard to the diagnosis the condition is easily differentiated from Bockhart's impetigo as the latter usually affects the legs its pustules are much larger and they always contain *Staphylococcus aureus* while in Microvesiculosis sparsa *Staphylococcus aureus* is constantly absent.

The prognosis is excellent and as regards treatment there is no need of using antibiotics or sulphonamide drugs. It is sufficient to sponge the parts with a salicylic acid alcoholic lotion (2 %) followed by the application of a disinfectant ointment to each spot. A good ointment is the following:

Beta naphthol	}	Ana	gram	0.30
Salicylic acid				
Carbolic acid				
Vaseline				
			gram	30

BACTERIAL PSEUDOMYCOSIS

Some years ago I introduced the term bacterial pseudomycosis (Archives of Dermatology and Syphilology 1928 Vol XVIII page 857) to denote skin affections which clinically resemble mycoses but which are not due to fungi or mycetes they are due to bacteria. Of bacterial pseudomycoses two chief clinical types may be distinguished:

- 1) The blastomycetoid type
- 2) The actinomycetoid type (nocardioid type)

Blastomycetoid type — In this type the lesions are vegetating and can easily simulate blastomycosis. A common example is *Dermatitis vegetans*. This affection is usually due to the ordinary pyogenic cocci (staphylococci) but in very severe cases of blastomycetoid pseudomycosis bacteria of the genus *Pseudomonas* of the genus *Encapsulatus* *Klebsiella* and of the genus *Proteus* may be present.



Bacterial pseudomycosis blastomycetoid type
a form of dermatitis vegetans

The diagnosis of these cases from true blastomycosis is made chiefly on the following data

- 1) The granulations are softer and are usually easily wiped off by rubbing the affected part, with a piece of gauze
- 2) No fungi are found
- 3) Potassium iodide treatment which is so useful in true blastomycosis has no action whatever on these cases while the continuous local application of a very simple disinfecting lotion such as mercury perchloride 1 in 1 000 frequently cures the disease. Castellani's paint gives good results

Actinomycetoid (Nocardoid) type — In this type the lesions may closely resemble agranular actinomycosis (agranular nocardiosis). In a typical case nodules are present which after a time soften and small abscesses form. These abscesses rupture and sinuses remain discharging a purulent material. A comparatively common variety is that due to *Bacillus typhosus* (*Eberthus typhosus*, *Ebertella typhosa*, *Salmonella typhosa*). In New Orleans two patients were sent to me with the diagnosis of probable mycosis. To my surprise and to the surprise



Bacterial pseudomycosis actinomycetoid (nocardoid)
type caused by *M. myceticus*

of everyone else no fungi were found instead the typhoid bacillus was grown in pure culture.

MICROCOCOCCUS MYCETICUS PSEUDOMYCOSIS (*Micrococcus myceticus* pseudo-actinomycosis)

I may say a few words on a form of pseudo actinomycosis (pseudo nocardiosis) on which I worked at first in New Orleans and in later years in North Africa. It is due to a micrococcus which I called *Micrococcus myceticus*. The first case I published in the *Archives of Dermatology and Syphilology* 1928 Vol 18 page 857.

The individual is in perfect health — suddenly he feels pain in the foot. He notices the presence of a red flattened nodule or a



Bacterial pseudomycosis actinomycetoid type due to *Bacillus typhosus*
(*Eberthius typhosus* *Eberthella typhosa* *Salmonella typhosa*)

plaque. He feels feverish and sick. Soon after the temperature shoots up to 103 F and to 104 F with signs of lymphangitis of the leg. After 24 hours the temperature becomes normal but the nodule does

not disappear Ten to fifteen days later the nodule softens and bursts and a sinus forms which persists for many months Two or three weeks later another nodule appears lymphangitis develops and the temperature goes up lasting a couple of days After the temperature goes down the nodule persists after a few days it softens and finally opens giving rise to a sinus This pathological process repeats itself until after a year or two practically the whole leg is covered with nodules gummatous swellings and sinuses The skin of the leg becomes greatly thickened and takes on an elephantoid appearance This variety as I have said of pseudo actinomycosis (pseudo nocardiosis) is caused by a microorganism which I have called *Micrococcus myceticus* and it can hardly be doubted that this organism is the true cause of the condition as in unopened lesions it is the only germ present and moreover by means of a pure culture of it the disease was reproduced in a volunteer

The treatment is very difficult Sulphanilamide and penicillin were not known when I studied the cases in New Orleans but in a recent case they have been tried without any benefit The only treatment that gives good results is a vaccine treatment the vaccine being prepared with the organism isolated from the unopened lesions of the patient no new nodules develop and the sinuses heal The elephantoid condition however remains unaltered

Cultures of *Micrococcus myceticus* will be gladly sent to any medical man desiring them

PSEUDOACTINOMYCOSIS SPIROCHAETICA

Clinically the condition is very similar to true actinomycosis of the non granular type Soft nodules and sinuses are found in the region of the angle of the mandible some parts of the face and upper portion of the neck The microscopical examination however reveals absence of fungi while innumerable spirochaetes are present The condition seems to develop after dental affections The best treatment is neorphenamin Penicillin may also be used

A fairly complete description of the disease may be found in my book *Malattie dell'Africa* Rome 1947

COMMON ULCERS OF THE LEG IN THE TROPICS

This is a very important subject to the tropical physician who is in general practice but until recently it was in a state of great confusion I have worked at the subject for many years and I have given my results in recent papers published in the *Anais do Instituto de Medicina Tropical* Vol v December 1948 and in the *Journal of Tropical Medicine & Hygiene* Vol 51 No 12 pp 245 254 December 1948 *Giornale di Medicina Militare* (July 1951) *Bulletin de la Societe Pathologie Exotique* (1952) tome 45 n 2 Mars Avril p 273

I have grouped the common ulcers met with in the tropics and subtropics as follows

- I) Tropical ulcers
- II) Cosmopolitan ulcers

The first group comprises the following ulcers

- 1) *Ulcus tropicum* (true tropical ulcer)
- 2) *Ulcus veldis* (veld sore desert sore sand sore)
- 3) *Ulcus pyogenicum* (septic sore)
- 4) *Ulcus tropicaloides* (tropicaloid ulcer)
- 5) *Macroulcus perstans* (persistent megaloulcer)

The second group (cosmopolitan) comprises chiefly

- 1) *Ulcus lueticum* (syphilitic ulcer tertiary)
- 2) *Ulcus varicosum* (varicose ulcer) and *ulcus varicosoides* (varicosoid ulcer)

I will give brief descriptions of the ulcers of the first group

With regard to ulcers of the second group I will limit myself to stating that *ulcus lueticum* is still quite common in many parts of the tropics while it has become comparatively rare in Europe owing probably to the better treatment of recent syphilis

Ulcus varicosum is as frequent in the tropics as in the temperate zone but there is no doubt that the term has been used very loosely everywhere to cover more than one ulceration. I have separated two types: *ulcus varicosum sensu stricto* and *ulcus varicosoides*. In the latter bacterial infection plays the chief role while in the former it is the back pressure the mechanical element which plays the essential role producing an aseptic process of necrosis.

ULCUS TROPICUM

This ulcer is known by many names mostly geographical. It is known as Aden sore as Naga sore as Ceylon sore as Madras sore



Symbiosis fuso spirochaetica

as Moambique sore as Cochin China sore and I might mention another twenty or thirty synonyms. It is interesting to note that the condition was apparently known to the ancient Indian medical men. In the works of Susruta (600 B.C.) descriptions are found of ulcers which probably were tropical ulcers.

Geographical distribution — The ulcer is very common all over the tropics and especially common in the equatorial or torrid zone. It is interesting to note that the sore decreases in frequency the more one goes from the equator towards the north or south.

Let us look at the map of Africa. You will find that the sore is extremely common in South Somaliland in Kenya Colony in the Tanganyika Colony Congo West Africa while the frequency decreases going towards North Africa and in the so called temperate part of North Africa which comprises the most northern portion of Libya and Cyrenanica the tropical ulcer is practically absent although local practitioners often use the term to denote any ulcerative condition they meet with. A few cases have been described in the Balkans and in the South of Italy but they are exceptional.



Ulcus tropicum

Etiology — It is generally believed that the ulcer is due to a symbiosis between a spirochaete (*S. vincenti* or *S. shaudinni*) and a fusiform bacillus known as *Fusiformis fusiformis* or *Fusobacterium Plauti Vincenti*. The bacillus was first described by Le Dantec and the spirochaete by Plaut and by Vincent. Some authors believe that the true aetiological agent is the spirochaete and they base their opinion on the following fact: if histological sections are made from the margins the more one goes towards the periphery the fewer bacilli are present. At the extreme periphery only spirochaetes are seen.

A few authors however believe that the fusiform bacillus is the true aetiological agent. In recent years the theory has been brought forward according to which the disease is not of parasitic origin. I do not believe this theory can stand. I have seen hundreds of cases of tropical ulcer and I have never noticed that a change in diet and the administration of vitamins produced any definite improvement in the ulcer although it may have improved the general condition of the patient.

Symptomatology — The disease begins as a single angry red papule or pustule surrounded by a zone of infiltration. After 2-3 days the papule or pustule breaks open and by a process of necrobiosis an ulcer forms which extends rapidly in depth and also on the surface. In most cases however after a few weeks the spreading ceases and then the ulcer remains practically of the same size for months and sometimes even for a year or two. In other cases a process of phagadenism sets in and then the ulcer becomes of enormous size with tremendous destruction of the soft parts of the leg and foot. The course is a very protracted one — two or three years — when the ulcer heals leaving usually a thin scar. Any slight traumatism may break the scar and the ulcer may start again.

Diagnosis — The chief diagnostic points are the following

- 1) The ulcer is single in most cases
- 2) Is situated on the lower portion of the leg
- 3) It is of large size and deep roundish or ovaloid
- 4) The margin is usually continuous and often slightly rolled never undermined
- 5) The fundus is covered by detritus in which spirochaetes and fusiform bacilli are found in enormous numbers

Differential Diagnosis — In practice the ulcer must be chiefly differentiated from luetic ulcer (tertiary) but in luetic ulcer the condition begins with a gumma while in true tropical ulcer it begins with a papulo-pustule moreover in luetic ulcer the margins are more cleanly cut «punched out» There are of course exceptions. A very

important feature in luetic ulcer is that the Wassermann test is positive

Prognosis — Favourable *quoad vitam* but the disease is a serious one as the patient is unable to attend to his work for many months and even years

Treatment — Every few months we hear of a new treatment Unfortunately so far no specific treatment has been found Penicillin is not very successful notwithstanding the many favourable reports published The newer antibiotics also do little or nothing The organic preparations of arsenic and especially arsphenamine and neoarsphenamine have no action Bismuth mercury the iodides are worthless Surgical treatment gives poor results The so called elastoplast treatment is of very little advantage Vitaminic treatment is practically worthless and the same may be said of calcium treatment On the whole the best treatment is still perhaps the old so called Ceylon treatment which later became the routine treatment also in many African countries Warm soaks are given with a potassium permanganate lotion (1 in 2 000) When the ulcer has become clean the so called protargol treatment is started viz an ointment is applied twice a day of protargol grm 5 vaseline grm 95 The ointment is applied on a piece of sterile gauze which is kept in place by a light bandage

ULCUS VELDIS

(Veldt sore Diphtheric Desert sore Sand sore)

The term *Ulcus veldis* has been used in the past to denote any number of different ulcers In recent years it has been restricted to denote an ulcer fairly common in the desert which is of true diphtheric origin The condition is caused by the true toxic *Corynebacterium diphtheriae* as found by Scott very many years ago during the Boer War

Symptomatology — The disease begins with a papulo or papulo pustule which is follicular After a few days the top of the papule becomes necrotic and an ulcer forms which slowly enlarges until it

reaches the size of a sixpenny coin and more. It is generally roundish



Incipient albus veld's

or ovaloid and at times on the fundus a whitish greyish pseudo



Veld sore *Corynephtherae* was found

membrane is seen which is removed with difficulty. In my experience

however the presence of this pseudomembrane is rather the exception than the rule. The ulcer runs a chronic course. Not rarely the patient may show signs of paralysis e. g. of the soft palate and heart symptoms (arrhythmia etc.) due to the toxin produced by the diphtheria bacillus.

Diagnosis — This is based on the bacteriological examination. In cases in which parosies are present the diagnosis can be made also clinically.

Prognosis — If the correct prognosis is not made and the specific treatment not given the ulcer has no tendency to spontaneous cure. If the correct diagnosis is made and the specific treatment given the prognosis is excellent.

Treatment — This is very simple: antidiphtheria serum by injection and also locally. It is interesting to note that penicillin has very little action on the ulcer and the results obtained cannot be compared with the efficacy of the antidiphtheria serum.

ULCUS PYOGENICUM (Septic ulcer Pyogenic ulcer)

The term is used to denote ulcers caused by the usual pyogenic cocci: staphylococci and streptococci. They clinically differ from the ordinary ecthymatous lesions in being more superficial but larger and with the appearance of true ulcers. In my experience staphylococci seldom give rise to true ulcers; streptococci do so more frequently and various clinically different types of streptococcal ulcers have been described also in Europe and in America. It suffices to mention Mele-
ney's microaerophylic streptococcus undermined ulcer. In the tropics the term septic sore is used to denote an ulcer usually of fairly large size (the size of a sixpenny coin to a shilling and more) roundish or ovaloid somewhat similar to *Ulcus velidis* but in which no diph. bacilli are found — only staphylococci and streptococci. The practitioner makes the diagnosis on the fact that the ulcer yields very rapidly to

the sulphonamides and to penicillin and a simple dressing with mercury perchloride lotion (1/1000) locally



Ulcus pyogenicum

ULCUS TROPICALOIDES

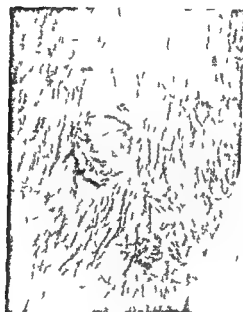
(*Ulcus mycetodes* *Ulcus Castellani* Mycetoid Desert Sore Superficial
Tropical Ulcer Ulcerative dermatitis of Castellani)

During the period 1940-1942 there occurred in Libya and in Cyrenaica numerous cases of a contagious ulcer of the leg — in fact an epidemic. The local practitioners called the ulcer *tropical ulcer* although even clinically the ulcer was quite different. I investigated the disease and soon came to the conclusion that the ulcer had nothing to do with true tropical ulcer that it was an ulcer of its own caused by a specific coccobacillus which I found and described with the name *Micrococcus (Coccobacillus) mycetoides*. My work has been confirmed by several workers among whom V. Servino (*Ulcera Tropicale Superficiale di Castellani* *Acta Medica Italiana di Malattie Infettive* Vol. 1, No. 6, Anno 1946).

A fairly complete description of *ulcus tropicaloides* with numerous illustrations as well as of several other ulcers of the leg may

be found in the *Giornale di Medicina Militare* (Rome) July Special Number 1951 and in the *Bulletin Societe de Pathologie Exotique* 1952 Vol 45 p 273 Seance du 12 decembre 1951

Geographical Distribution — The ulcer is not found only in Lybia and Cyreniaca I have seen and investigated several cases in



Incipient Tropicaloid ulcer natural

Italy They were coming from a rural district not far from the city of Rome — Abruzzo I have seen two cases in Spain and one case in Portugal

Etiology — If the contents of an initial vesicle or bulla — the disease begins practically always with a vesicle or bulla — are collected by means of a sterile Pasteur pipette and films are made stained with Gram and counterstained with diluted fuchsin numerous coccal and coccobacillary bodies are seen which are stained red they are

therefore Gram negative. If the contents of a bulla are inoculated on an ordinary agar tube only a very scanty growth or no growth at all is noticed. If tryptic agar is used the growth is more abundant and the organism can be properly further investigated. It grows scantily in gelatine the medium is not liquefied it grows fairly well on



Incipient Tropical d at er experimental obtained by inoculating a pure culture of *Micrococcus (Coccobacillus) mycetoides* in a volunteer

coagulated serum without producing liquefaction. The organism can be trained to grow in liquid media and then its fermentative reactions can be studied. It produces no gas in any sugar acidity in dextrose and various other sugars.

Pigment — No pigment production is found on ordinary Italian agar but on Difco agar and especially on glucose difco agar the colonies are yellow. If from the yellow cultures ordinary Italian agar

tubes are inoculated the colonies which develop are pigmentless. The pigment does not diffuse in the medium.

Pathogenicity — The organism is not pathogenic to the ordinary laboratory animals — guinea pigs, rabbits and rats. Its injection by the subcutaneous or intraperitoneal route does not cause any general symptoms or any local lesions. The organism however is pathogenic to man and by injection of pure cultures of it is quite easy to reproduce the ulcer. The technique is as follows: a spot on the leg of the volunteer is scratched until a little blood is drawn. Then two or three loopfuls of a young agar culture of a recently isolated strain is applied to the spot; a piece of sterile dry gauze is put on and kept in place with a tight bandage. Within six to ten days an ulcer is produced which is practically identical with the natural ulcer.

Symptomatology — In a fairly well advanced case on the lower two thirds of the leg one or two or three rarely four practically never more ulcers are seen. Each ulcer is roundish or ovaloid rather superficial, the size of a sixpenny coin to a shilling. The margins are not raised, not thickened, not undermined. They may be continuous or delicately dentellated or crenated. The fundus which is rather shallow is often covered by a thin film of pus, occasionally instead of pus, fibrinous pseudomembranes are seen. The subjective symptoms are slight: a little discomfort and pain in the leg, usually if the ulcer is kept bandaged the patient may attend to his work. There are cases however when the pain is severe and the patient has to be hospitalized.

Course — The course is a prolonged one — three to six months occasionally longer. It is interesting to note that during the whole course the regional superficial lymphatic glands are not enlarged. It is also interesting to note that among the hundreds of cases I have seen I have never noted any serious complication. I have never seen a case of erysipelas or lymphangitis or abscess or septicaemia originating from the ulcer. After three to six months from the onset the ulcer usually heals spontaneously leaving a hyperpigmented scar, occasionally a hypopigmented one. The short description I have

given is the usual type of the ulcer but there are several clinical varieties or types of which I will mention the following

- 1) The superficial type
- 2) The plaque like type
- 3) The eczematous type

In the *superficial type* the initial bulla — the condition begins always with a vesicle or bulla which is not follicular — is very superficial but of large dimensions. When it breaks a raw area remains resembling a large abrasion rather than an ulcer. In these cases also the corium must be involved as when it heals the lesion leaves a scar.

The plaque like type — In this type there is no real ulcer. Instead a large roundish or ovaloid slightly raised plaque is seen with a smooth intact surface. From time to time however a few minute ulcers appear on the surface of the plaque which rapidly heal. The plaque after three to six months disappears without leaving a scar but leaves usually some pigmentation.

The eczematous type — In this type too there are no ulcers. Instead one or two or three eczematous roundish or oval patches are seen with a well defined margin (marginated patches). The surface of the patch or patches is covered with minute yellowish crusts. When these are removed an oozing area is seen. The secretion rapidly dries up into minute crusts again. The appearance of these patches is practically that of eczema nummular.

Diagnosis — This is based on the symptoms I have mentioned and on the presence of *Micrococcus (Coccobacillus) mycetoides*.

Differential diagnosis — The condition must be differentiated chiefly from *Ulcus tropicum* and *Ulcus veldis*. *Ulcus tropicum* is a much more serious condition. The ulcer is deeper, larger and more persistent. The microscopic examination shows presence of numerous spirochaetes and fusiform bacteria. In *Ulcus veldis* the condition begins usually as a follicular papule and not as a non follicular vesicle and

the bacteriological examination will reveal the presence of the true toxic *Corynebacterium diphtheriae*

Prognosis — *Good quoad vitam* The course however is long three to six months

Treatment — Unsatisfactory Sulphonamides and penicillin have little action The vaccine treatment is not of much use It is a mistake to employ caustics and strong disinfectants On the whole the following very simple treatment gives the best results The patient is kept at rest for a few days and for three days hot boric fomentations are carried out every four hours When the ulcer or ulcers become clean they are then dabbed with hydrogen peroxide followed by an ointment consisting of dermatol 4 grms vaseline 26 grms The ulcer is covered with a piece of sterile gauze and lightly bandaged

Cultures of *Micrococcus (Coccobacillus) mycetoides* will be gladly sent to any medical man requesting them They may be obtained also from the American type Culture Collection 2029 «M» Street N W Wash ngton

ULCUS INTERDIGITALE PEDUM

This affection is not rare among natives It was described in 1909 by me and my work was confirmed by Breml Martinez and Lopes An account of it may be found in Castellani & Chalmers Manual of Tropical Medicine (London 1919) pag 2188 The patient complains of some itching between the toes though no papules or vesicles are seen After a few days a fissure appears which rapidly deepens and enlarges into a large oval ulcer with a dull dark red fundus and sodden looking margins There is practically no discharge whatever According to some authorities it is due to an actinomyces (*A keratolyticus*) The ulcer is generally very painful The skin surrounding the ulcers does not show signs of inflammation Under proper treatment the ulcer heals in a few days The patient must remain at rest washing the ulcer twice daily with

a one per cent carbolic lotion followed by dressing with a bismuth boric acid ointment

Bismuthi subnitritus	Grm 2
Acidi borici	Grm 1
Vaseline	Grm 30

MORBUS HAEMORRHAGICUS BULLO ULCERATIVUS KELOIDALIS

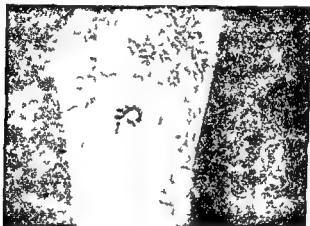
This grave disease has been described by me in the *Anais do Instituto de Medicina Tropical* Vol v December 1948 and in the



Large ulcer in a case of morbus haemorrhagicus bullo ulcerativus keloidalis

Journal of Tropical Medicine & Hygiene October 1949 The description was based on two cases (very recently a third case has come under my observation) The patient for two or three days feels

poorly and feverish then he notices the appearance on the legs and other parts of the body of some vesicles and bullae which he says were black from the onset. The bullae are of large size — the size of a bean or small chestnut. They are tense and of a very dark colour this being due to the haemorrhagic fluid they contain. After a time the bullae rupture and ulcers form which are roundish or ovaloid — occasionally quadrangular. They are fairly deep have a fine granular surface and the surface is usually covered by a thin film of dark blood. Most of the ulcers heal within two or three months leaving



Cheloidal scars in a case of morbus haemorrhagicus
bullo ulcerativus keloidalis

scars which are often keloidal. A few remain open for many months. An ulcer in the second case remained open for eighteen months.

The disease is not merely a skin disease. It is a general disease. From time to time internal haemorrhages take place — especially from the stomach and the intestine. In the second case every two or three months the patient had an attack of severe abdominal griping and each attack was followed by the passage of several haemorrhagic stools. Some were red others were black like tar this showing that the haemorrhages were taking place also high up in the small intestine. The usual clinical physical and X ray examination of the various internal organs do not reveal much. The liver is not enlarged and

not tender the spleen is not palpable the superficial lymphatic glands are not enlarged

Blood — The examination of the blood shows presence of a certain degree of anaemia of the orthochromic or hypochromic type which however is never severe nucleated red cells are never seen An interesting feature is that the number of platelets is not decreased or only slightly so In the second case the number was 180 000 per cubic mm — therefore practically normal The haemorrhagic and coagulation times are within normal limits

Course — This is a very protracted one In the second case the disease lasted over 18 months

Diagnosis — The chief diagnostic points are the following

- 1) The presence of haemorrhagic bullae
- 2) Presence of deep ulcers
- 3) Presence of keloidal scars
- 4) The protracted course
- 5) The presence of a micro organism of the *Pseudomonas* type

Differential Diagnosis — My first two cases were seen by a number of colleagues and many different diagnoses were offered Usually the disease was considered to be a form of Werlhoff's purpura or of scurvy The disease is not Werlhoff's purpura haemorrhagica In purpura haemorrhagica large haemorrhagic bullae and deep ulcers are absent Moreover the number of blood platelets is greatly decreased which is not the case with the disease I have described

Scurvy — In very severe cases of scurvy bullae and occasionally ulcers may be present but they are generally limited to the lower parts of the leg Moreover scurvy answers rapidly to vitamin C therapy which has no action whatever on the disease I am describing

Onyalay — The suggestion has been made that the disease is onyalay What is onyalay? It is a haemorrhagic disease fairly common among the natives of Portuguese West Africa It has been found in

recent years also in other parts of that continent especially in Rhodesia the Congo and Tanganyika. It is a febrile disease running a very short course — 12 to 15 days. On the oral mucosa large trabeculated bullae are seen full of blood. Very seldom the bullous eruptions are found also on the skin. Moreover in onyalay the number of blood platelets is very much reduced.

Pemphigus — In *Pemphigus vulgaris* no deep ulcers followed by keloidal scars are seen. In acute pemphigus the course is very short and the disease usually terminates fatally. In *Pemphigus mitis* a disease usually of children the bullae do not contain blood the general health is hardly affected and spontaneous cure often takes place at puberty.

Prognosis — This is serious. Both patients gave us a great deal of anxiety and on several occasions we thought we were going to lose them. Fortunately they both recovered. It seems therefore that the disease is a serious one but that it has tendency to get cured spontaneously.

Treatment — This is very unsatisfactory. In the case seen in Africa we tried the sulphonamides without any good result. In the case in Italy we tried also penicillin and streptomycin but with very little success. The treatment is merely symptomatic.

Etiological Researches — In the unopened bullae and also frequently in the ulcers a rod like organism is found always in pure culture. It is a motile Gram negative nonsporogenous rod which grows well on all ordinary media. For several months after isolation it grows very abundantly producing a crinkled growth at times almost cerebriform on some media such as glycerol agar. After some months however of continuous subculturing the organism loses some of its original cultural characteristics. It does not grow any longer so abundantly and the cultures are no longer crinkled moreover it begins to produce a greenish pigment not only in glycerine agar but also in other media although never in so called poor agar viz agar prepared with peptone water instead of meat infusion. The organism at first appears to be close to *Malleomyces pseudomallei* but later after it

has been cultured for six to eight months it seems to be much more closely allied to members of the genus *Pseudomonas*. In contrast to the typical *Pseudomonas aeruginosa* it never produces pigment in poor agar nor in peptone water. I considered it at first a new bacterial species but in all probability it is merely a variety or possibly merely a strain of *Pseudomonas aeruginosa* (*P. aeruginosa* var. *haemorrhagica*). It differs serologically from the three other strains of *aeruginosa* I have in my collection.

MACROULCUS PERSTANS

Ulcus perstans

I have had to date five cases of this condition which I have described in the *Anais do Instituto de Medicina Tropical de Lisboa* Vol. VI 1949. The ulcerative process usually begins very gradually but progressively in a small loss of substance in the leg caused by trauma or in a small wound. In the patient depicted in the photograph the ulceration slowly developed after a small war wound in the leg during the First World War which never healed.

At complete development one or more ulcers of enormous dimensions are seen. Typically the outline of the ulcer has a somewhat festooned appearance. The ulcer is fairly deep, the margins are not undermined, the fundus is often granulomatous and may be covered with a thick film of pus in neglected cases. True acute phagadenism is never noted. The ulcer is often surrounded by a large zone of inflammation with oedematous red skin and well marked venules.

Etiology — In all the five cases I have found a pyococcus similar or identical with the typical *Pseudomonas aeruginosa* as it produces a green pigmentation also in the so called poor media — *poor* agar prepared with peptone water or even simple water instead of meat infusion. There are always present other bacteria among which often *Micrococcus fermentans*, *Bacterium albidobonense*, *Bacterium fluviosolobonense* and occasionally *Serratia marcescens* (*Bacillus prodigiosus*). For descriptions of these organisms see *Centralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene* I Orig. 157 1951.

Spirochaetes and fusiform bacilli are completely absent or present only in very small numbers. Fungi are not found except occasionally a few yeast like cells of *Candida* (*Monilia*)

Diagnosis — This is based on the presence on the leg of one or more extremely large ulcer with the characters described above



Case of macronleus peritans

The important signs for the diagnosis are the slow onset extremely prolonged course extending for years and years the somewhat festooned outline the margins which are neither punched out nor undermined the negative Wassermann test

Differential Diagnosis — The ulcer is often mistaken for tropical ulcer but the tropical ulcer seldom exceeds two years in its course

and moreover true acute phagaedenism is often present and the microscopical examination shows presence of numerous spirochaetes and fusiforme bacilli

Geometric Necrotic Ulcer of French Authors — This ulcer has cleancut margins and runs a very rapid course with severe signs of acute phagoedenism

Maloney's Chronic Burrowing Streptococcus Ulcer — This ulcer may also show enormous dimensions but the margins are always extensively undermined and the bacteriological examination shows constant presence of a microaerophilic streptococcus

Varicose Ulcer — True large varicose veins may be completely absent in *ulcus perstans* although some of the superficial minute venules in the inflamed zone around the ulcer may be dilated and inflamed Complete rest in bed has hardly any effect on macroulcus

Veld Sore — Veld sore is of much smaller dimensions than macroulcus and if correctly diagnosed is easily and rapidly cured anti diphtheria serum being specific

Septic Ulcer — This sore is of much smaller dimensions than macroulcus and is easily cured by sulphonamides and penicillin

Tropicaloid Ulcer — Much smaller than macroulcus its duration seldom exceeds three to six months and bacteriological examination will show presence of *Micrococcus (Coccobacillus) mycetoides*

Tubercular Ulcer — This is rare on the leg The inoculation into a guinea pig is usually positive

Amoebic Ulcer — This is an extremely rare ulcer in which *Entamoeba histolytica* is found It answers rapidly to antiamoebic treatment

Leishmanic Ulcer — Rare on the leg Leishmaniae found

Mycotic Ulcers — In ulcers of mycotic origin ■ g Blastomycosis Coccidiomycosis Paracoccidiomycosis Actinomycosis Histoplasmosis etc laboratory examinations will put in evidence the causative mycetes Potassium iodide is practically specific for most of them In *Macroulcus perstans* fungi are always absent excepting occasionally a few yeastlike organisms of the *Candida* type

Drepanocytosis — In cases of drepanocytosis not rarely an ulcer is found on the leg but it is of much smaller dimensions The microscopical examination of the peripheral blood will show presence of falciform red cells

Prognosis — Favourable quoad vitam but the ulcer has practically no natural tendency to healing and may last for a life time

Treatment — This is most unsatisfactory Penicillin in enormous doses is useful Terramycin apparently has no action Aureomycin and chloromycin in a recent case seemed to be useful Local treatment consists in applying a sulphonamide powder after cleaning with hydrogen peroxide

FISSURA LABIALIS MEDIANA

Symptomatology — The condition on which so far as I know there is no literature apart from the papers I have published is characterized by the presence of a fairly deep fissure in the middle of the lower lip which generally begins as an ordinary crack The case runs a chronic course often with periods of apparent quiescence and reactivation A slight amount of exudation may be present but ■ definite crust seldom forms and apart from the fissure the lip may have a normal appearance and ecematoid lesions are usually absent In some cases the fissure ■ painful in others there is little or no pain From time to time acute symptoms may appear the fissure then becoming angry looking and the whole lip swollen though generally it does not show diffuse ecematoid lesions The Wassermann reaction is negative

Course — As I have already stated the condition runs a very chronic course in most of my patients it had been present for several years. The complaint seems to be more frequent among men than among women and it is more often encountered in adults than in children. It appears to be more prevalent in warm climates than in cold countries. I have seen cases in Africa in Ceylon and in Europe. It is quite common in Louisiana.

Etiology — There are three aetiological varieties 1) bacterial 2) mycotic 3) avitaminic. The first variety is usually due to the ordinary pyogenic cocci but some cases appear to be due to organisms



Fissura labialis mediana

of the *Bacillus lactis aerogenes* type alone or associated to streptococci or staphylococci. The second variety is generally due to fungi of the genus *Candida*. The third variety is due to lack of certain vitamins chiefly vitamin B (riboflavin).

Complications — In one instance in New Orleans the fungal infection from the labial fissure spread to various parts of the face including the bones. Two sinuses in the left cheek developed from which the same fungus — *Candida* — was isolated as had been found in the tissues.

Diagnosis — The presence of a fairly deep fissure in the central part of the lower lip without any true ex-ematoid condition of the lip is characteristic. It is differentiated from luetic fissures by the

negative Wassermann and the uselessness of specific anti-tubercular treatment *Perleche* (stomatitis angularis) affects the angles of the mouth and the parts have a peculiar whitish sodden appearance. In my opinion however the two conditions may have a very similar or identical aetiology.

Treatment — Treatment is often difficult. The cautious application of one or two per cent solution of silver nitrate gives the best results. The use of glycerine of borax and rose water in equal parts is at times beneficial. In certain cases when the mycotic element plays an important role internal administration of potassium iodide seems to be useful. In cases of pyogenic origin sulphonamides and penicillin may do good and in cases of avitaminic origin a diet rich in vitamins especially vitamin B₂ should be prescribed.

MYCOLOGICAL NOTES

Before discussing certain little known mycoses it may perhaps be advantageous to say a few words on fungi and mycetes in general. These remarks being addressed to clinicians and not to mycologists and bacteriologists will be as simple as possible.

Fungi as well known are considered to belong to the Vegetal Kingdom although a few authorities deny this believing them to form a group apart from both the Vegetal and the Animal Kingdom.

The Vegetal Kingdom is separated into four sub kingdoms or phyla or divisions

- 1 — Spermatophyta or Seed Plants (known also as Phanerogamae or Flower Plants)
- 2 — Pteridophyta or Fern Plants
- 3 — Briophyta or Moss Plants
- 4 — Thallophyta or thallus plants or filamentous plants

Thallophyta are generally filamentous plants of simple cellular structure which differ from other plants in that they do not develop a complex plant body with differentiation into roots stem and leaves.

The phylum or division *Thallophyta* contains three subphyla or subdivisions

- 1 — *Algae*
- 2 — *Schizomycetes* (Bacteria)
- 3 — *Fungi* or *Mycetes*

The *Algae* contain chlorophyll and therefore by a process of photosynthesis they may manufacture their own food synthesizing it from carbon dioxide and water with aid of sunlight (Photosynthesis)

The *Schizomycetes* or Bacteria are unicellular organisms which do not contain chlorophyll and therefore cannot synthesize their food and have to live as parasites or saprophytes. They are microscopically of small dimensions spherical rodlike comma like wavy screw like. They do not form true continuous branching filaments. On ordinary microscopical examination with the light microscope they do not possess well defined nuclei. They reproduce by scission (or by scission and spores). For the classification of bacteria books on Bacteriology should be consulted.

It will suffice here to state that at present most authorities admit five orders

- 1 — Spherical or rodlike or comma like or non flexible spirals non branching — *Eubacteries*
- 2 — Rodlike or filamentous definite branching or tendency to branching — *Actinomycetales*
- 3 — Flexible spirals — *Spirillochaetales*
- 4 — Cocci bacillary grow only in the presence of living cells — *Rickettsiales*
- 5 — Invisible with the ordinary light microscope Filter passers — *Virales*

The order *Actinomycetales* contains two families 1) the *Mycobacteriaceae* — branching slight or only tendence to it 2) *Actinomycetaceae* — branching definite. For convenience following Vuillemin we place the *Actinomycetaceae* among the *Fungi Imperfecti* Order *Microsporiales*

Mycetes or *Fungi* — *Thallophyta* which similarly to the *Schizomycetes* do not possess chlorophyll and therefore live as parasites on living vegetation and on small organisms or as saprophytes on dead organisms and decaying organic matter. They reproduce by spores or by fission. They grow usually forming long branching filaments and possess well defined nuclei. The vegetative cells of the *Fungi* with exception of the *Actinomycetaceae* are much larger than those of the Bacteria.

A fungus may be said to consist of two parts a vegetative part usually filamentous (mycelium) devoted to the acquisition of food and a reproductive part represented by the spores and sporogenous structures. The term thallus is used to denote the whole plant both mycelium and spores; it is also often used as a mere synonym of mycelium. The mycelial filaments are known as hyphae. A hypha

may be septate or non septate and grows and extends apically and proliferates by branching which may be dichotomous or lateral. The spores are the reproductive structures and may be compared in a way to the seeds of the higher plants but are merely spheric, oval or elongated cells with a thin wall containing protoplasm and not a miniature of the plant.

The spores are of two types: those that are sexual in origin and those that are asexual in origin. The sexual spores are those formed by the conjugation or fusion of two sex cells or gametes or those in the production of which there is primary nuclear fusion with reduction in chromosome number. The asexual spores are those which are not the result of the fusion of two sex cells or gametes. Practically all fungi produce asexual spores; some produce both asexual and sexual spores.

Sexual Spores — The more important sexual spores are the ascospores, the basidiospores, the zygospores, the oospores.

The ascospores are born in a sac-like cell, the ascus. Usually the ascus contains 2 or 4 or 8 or a multiple of 8 spores. The origin at times is not sexual.

The basidiospores are born at the apex of the 2 or 4 slender processes — one spore on each process — which are found on a special elongated, somewhat claviform structure called basidium which is the sporogenous organ.

A zygospore is formed by the conjunction and fusion of two morphologically identical cells (isogametes).

The oospores derive from the conjunction of two morphologically different structures: the male element or antheridium and the female element or oogonium. The oogonium is a roundish structure with a thick capsule presenting several pores and containing some roundish protoplasmic masses, the oospheres. The antheridium comes into contact with the oogonium, penetrates it and divides into a number of motile bodies, antherozoids, which fertilize the oospheres which now become oospores.

Asexual Spores — The principal ones are the blastospore, the arthrospore, the chlamydospore, the hemispore, the conidium.

Blastospore — This spore is formed by a process of budding. On the parent cell a small bud appears which enlarges and becomes a cell identical to the mother cell. It may remain loosely attached to it or may become detached but it may multiply by budding whether it remains attached or becomes free.

The *arthrospore* originates from the close septation and later disarticulation of a mycelial hypha. At first it is generally quadrangular or rectangular, later when it has become free it often takes a roundish or ovaloid shape.

The *chlamyospore* or *hynospore* is a large arthrospore undergoing encystment and is produced by a condensation of the protoplasm of the hypha. It has often a double contour, contains lipoid and other granules, its diameter is larger than the diameter of the hypha from which it has originated. *Chlamydo-spores* may be intercalary, lateral or apical.

The *conidium* is usually a roundish or ovaloid spore which forms on a hypha laterally by a process of gemmation or apically by constriction and abstriction. The hypha bearing the conidia is called «conidiophore». When the conidiophore is very short it is generally called a pedicellum.

Biological Characters Enzymes — Many fungi produce enzymes with ferments which may induce profound changes in many substances. Certain fungi, e. g. *Saccharomyces cerevisiae* and *Saccharomyces ellipsoideus* contain enzymes which will cause alcoholic fermentation of glucose and certain other sugars with production of ethyl alcohol and carbon dioxide.

The phenomenon is represented by the well known Gay Lussac's equation



Toxins — Production of exotoxins and endotoxins may occur but is never so well marked as among the bacteria.

Production of Antibiotic Substances — Secretion of substances lethal or antagonistic to bacteria but seldom to other fungi is noted in a number of fungi, especially of the genus *Penicillium* and *Acti-*

nomyces It suffices to mention penicillin chloromycin aureomycin terramycin

Immunology — Fungi may act as antigens and allergens In patients affected with certain mycoses agglutination and complement fixation reactions may be noted and also formation of precipitins and of opsonins

Pathogenic Action — Fungi are the causative agents of a number of diseases in plants and animals especially the former

Fungi as Agents of Disease in Man — In man diseases of fungal origin are not so common as diseases of bacterial or protozoal origin though they are of great importance especially in tropical pathology It suffices to mention the blastomycoses the mycetomata and the tinea Fungi may attack any organ and system of the human body the integumentary system being the most frequently and the nervous system the most rarely affected Diseases of fungous origin are known as *mycoses* and may be classified into two large groups *internal mycoses* and *external mycoses* or *dermatomycoses* The *dermatomycoses* may be subdivided into (a) the *dermatomycoses sensu stricto* in which the skin is affected and not the hair (b) the *trichomycoses* in which the hair is affected and not the skin (c) the *dermotrichomycoses* in which both skin and hair are affected

Fungi parasitic of the skin and hair are known as *Ectophytes* those of the internal organs as *Endophytes* It must be kept in mind however that the same fungus may at times attack the skin as well as the internal organs — *Sporotrichum schenckii* *Coccidioides immitis* *Candida* etc

Symbiosis — We use the term *symbiosis sensu lato* to indicate the living together of two organisms in close association their close association apparently not being detrimental to either of them

Symbiosis sensu stricto means that the association is obligatory and not only is not detrimental but is also mutually beneficial

The term *synergism* is used by some authors when the combined action of two or more organisms effects changes which each by itself is incapable of achieving

A number of fungi are capable of living in symbiosis. Botanists years ago discovered that certain plants — the lichens — represent a symbiosis of a fungus and an alga. They also found that symbiosis plays an important role in the nutrition processes of numerous plants and in the germination of certain seeds.

Symbiotic Gas Fermentation Phenomenon (Castellani's Symbiotic or Synergistic Gas Fermentation Phenomenon) — This phenomenon has been described by Castellani. It may be defined as follows: with certain species of bacteria and fungi, two organisms, neither of which alone produces gas fermentation in certain carbohydrates, may do so when living in symbiosis or artificially mixed together. For example, *Aspergillus* (sp.) does not produce gas fermentation of maltose (acidity only). *B. morganii* (*B. morganii* No. 1) does not touch maltose/does not gas ferment this sugar. The mixture *Aspergillus* + *B. morganii* will produce gas, though slowly. *Bacillus typhosus* alone does not produce gas fermentation of mannitol (acidity only). *B. morganii* does not produce fermentation in that substance (neither acid nor gas). The mixture *B. typhosus* + *B. morganii* will produce gas. The symbiotic gas fermentation phenomenon occurs only with certain species of fungi and bacteria.

TAXONOMY — Every individual plant and therefore every fungus belongs to a species (*Species*); every species belongs to a genus (*Genus*); every genus to a family (*Familia*); every family to an order (*Ordo*); every order to a class (*Classis*); every class to a division (*Phylum*); every division (*Phylum*) to the vegetable kingdom (*Regnum vegetabile*). A species may contain several varieties (*Varietas*), forms (*Forma*) and races or biological forms (*Forma biologica*). A genus may contain several subgenera (*Subgenus*); a family several subfamilies (*Subfamilia*) and tribes (*Tribus*); an order several suborders (*Subordo*); a class several subclasses (*Subclassis*); a division several subdivisions (*Subdivisio*). The complete list of categories is therefore using the Latin terms as follows:

Regnum vegetabile Divisio (Phylum) Subdivisio (Subphylum) Classis Subclassis Ordo Subordo Familia Subfamilia Tribus Subtribus Genus Subgenus Sectio Subsectio Species Subspecies

Varietas Subvarietas Forma Forma Biologica Forma Specialis Individuum

The names of orders end in *ales* those of Suborders in *aeae* those of families in *aceae* The species is designated by a binomial the first portion of which is the *generic name* while the second portion is the *specific name* The generic name (*Genus*) should be written with a capital letter the specific name usually with a small letter A fungus may be transferred from one genus to another but the specific name remains the same it cannot be changed The rules of nomenclature are given in detail in the supplement to the Journal of Botany June 1934

CLASSIFICATION OF MYCETES (FUNGI)

In practice the Subphylum or Subdivision Mycetes may be separated as follows

Subphylum or Subdivision MYCETES (Fungi)	Superclass I	vegetative body a multinucleated naked plasmodium — MYXOMYCETES
	Superclass II	vegetative body not a naked plasmodium and typically filamentous — EUMYCETES

The fungi parasitic of man belong to the Eumycetes This superclass contains four classes

EUMYCETES (<i>Fungi sensu medico</i>)	Mycelium continuous non septate	Reproduction by Zygosporcs and asexual spores — Class PHYCOMYCETES
	Mycelium septate	Reproduction by Ascospores — Class ASCOMYCETES Reproduction by Basidiospores — Class BASIDIOMYCETES Reproduction by Asexual spores — Class DELOMYCETES or FUNGI IMPERFECTI

The fungi found in human mycoses may belong to practically any of the classes mentioned except the Basidiomycetes which do not occur in man or only exceptionally

CLASS I PHYCOMYCETES De Bary 1856

Definition — Fungi with mycelium continuous not septated. Two families are of medical interest 1) Asexual spores in typical sporangia columella present — Family *Mucoraceae* 2) Mycelium absent or rudimentary — Family *Chytridiaceae*

FAMILY MUCORACEÆ

These organisms have a ramified thallus branches taking origin laterally or by dichotomy. Some species are provided with *rhizoids* root like hairs by which they are attached to the surface on which they grow. From the mycelium some aerial branches called gonidiophores take origin each of which supports on its distal extremity a pear shaped globular or claviform sporangium called *gonidangium*. The sporangium is at first separated from the gonidiophore by a septum which later protrudes into the lower portion of the sporangium to form a variously shaped structure termed *columella*. The sporangiophore may present beneath the columella a funnel shaped expansion referred to by some authors as *apophysis*.

Inside the sporangium or gonidangium *endospores* or *gonidia* develop by cell formation. They are known as sporangiospores and they are asexual in origin.

The sporangial protoplasm not used in the formation of endospores gives rise to a peculiar mucilaginous substance which at a later period by absorption of water causes the bursting of the sporangium. Each endospore or gonidium when it has become free gives rise to a mycelial tube by germination. This mycelial tube or hypha ramifies and a new mycelium is formed.

Reproduction may take place also by means of *zygospores*.

Classification — Four genera of Mucoraceae are found to contain species parasitic on man —

Family Mucoraceae	{	Mycelium ramified no rhizoids — <i>Mucor</i>
		Mycelium non ramified with or without rhizoids sporangia pyriform the peduncle supporting the sporangium terminates in a special formation encircling the base of the columella — <i>Lichtheimia</i>
		Mycelium with rhizoids columella ovoid — <i>Rhizomucor</i>
		Mycelium with rhizoids columella hemispheric flattening and shaped like a mushroom after dehiscence — <i>Rhizopus</i>

From a medical point of view the most important genus is *Mucor*

GENUS MUCOR Micheli 1729

Mucoraceae with ramified mycelium absence of rhizoids stolons or runners not formed sporangiophores simple or branched sporangia borne apically on the sporangiophore and its branches formation of zygospores from equal gametes usually heterothallic

MUCOR MUCEDO Linnaeus 1764

Synonyms — *Mucor vulgaris* Micheli 1729 *M. sphaerocephalus* Bulliard 1791

The colonies on glucose agar are white or silvery white at first later greyish or blackish grey

The hyphae carrying sporangia (sporangiophores) are long and erect The sporangium is globular 100 to 200 μ in diameter its colour brownish its surface covered by fine minute crystals of ovalate of calcium The spores (gonidia) are elliptical with a smooth surface The columella is ovoid shaped and generally yellowish Occasionally very large zygospores may be observed

The spores are usually $12 \times 3.6 \mu$ hyaline the columella $70-140 \times 50-80 \mu$ hyaline or slightly yellowish. Zygo-spores spherical $90-25 \mu$ in diameter with black membrane and uncoloured contents. This fungus liquefies gelatine and certain strains of it seem to be capable of inducing a slight degree of alcoholic fermentation in glucose and other sugars.

M. mucedo L. is very common living in organic substances in decomposition for instance horse dung. It is the cause of a deadly disease in bees the so called mucorine or «May's disease». It is seldom found in man but it may although very rarely cause a broncho-pulmonary mycosis.

This fungus has not rarely been found saprophytic in the vagina of women who work in farmyards and stables.

In practice *Mucor mucedo* is recognised chiefly by its unbranched sporangiophore and the ovoid or cylindrical shape of its columella. It is a heterothallic species. It produces proteolytic and fat splitting enzymes. It induces decomposition of leather and is often isolated from retting flax. It is believed to play a role in the ripening of snuff.

It is as a rule easily isolated from fresh horse dung.

Other species — *Mucor racemosus* Fresenius 1850. *Mucor paronychius* H. Sutherland Campbell and O. A. Plunkett 1934. *Mucor pusillus* Lindt 1886.

GENUS LICHTHEIMIA Vuillemin 1904

Mucoraceae with non ramified mycelium. Rhizoids may be present or not. Peduncle supporting sporangium terminates in a formation encircling the base of the columella.

The type species is *Lichtheimia corymbifera* (Cohn 1884). Some authorities identify this genus with the genus *Absidia* Tieghem 1876.

Other species are — *Lichtheimia corymbifera* (Cohn 1884) Vuillemin. *Lichtheimia ramosa* Lindt 1886 Vuillemin. *Lichtheimia cornealis* (V. Cavara and Saccardo) 1913.

GENUS RHIZOMUCOR Lucet and Constantin 1900

Mucoriceae with presence of rhizoids columella of ovoid shape. Some authorities consider all the members of this genus to belong to the genus *Rhizopus* and omit it from the generic classification of the Mucoraceae.

Type species — *Rhizomucor parasiticus* Lucet & Constantin 1900

FAMILY CHYTRIDIACEAE

Definition — Phycomycetes with mycelium absent or rudimental. Ashworth's investigations have shown that *Rhinosporidium seeberi* the parasite causing a variety of nasal polypus is not a protozoon but a fungus. The classification of this fungus is very difficult but following Brumpt ~~we~~ have temporarily placed the genus *Rhinosporidium* in the class Phycomycetes subclasse Oomycetes family Chytridiaceae. Langeron and Brumpt place in the same family the genus *Coccidioides* but in my opinion *Coccidioides* presenting a large amount of septate mycelium in culture cannot be placed in this genus.

RHINOSPORIDIUM SEEBERI Wernicke 1900

Synonyms — *Rhinosporidium kinleayi* Minchin and Fantham 1905. *Coccidium seeberi* Wernicke 1900 (?). *Rhinosporidium equi* Zachokke 1913.

Rhinosporidium was discovered in 1896 by Dr. Guillermo Seeber in Buenos Aires in a nasal polypus in a young man of nineteen years of age. In 1900 he published a description of the parasite and in the same year Wernicke gave it the name of *Coccidium seeberi*.

Morphology — Inside the polypus mass the parasite is present in the form of small white spherical bodies of very variable size. The smallest are only 6 microns in diameter they have a chitinous membrane and the cytoplasm is vacuolated and has a vesicular nucleus.

The largest spherical bodies which are now considered to be ripe sporangia measure 300 microns in diameter they have a well marked membrane sometimes striated They contain thousands of spores in a medium of mucoid substance The spores have one nucleus They contain refringent spherules which are in reality proteic reserve granules and are partially siderophile When the spores are ripe they are discharged through a single pore in the sporangium They spread in the tissues become spherical and gradually increase in size The nucleus divides many times and in contrast to what one observes in the *Neosporidia* nuclear mitoses are simultaneous Attempts at cultivation have so far failed

CLASS II ASCOMYCETES

These fungi are characterised by their mode of reproduction — by spores originating inside special cells called asci The spores (ascospores endospores gonidia) inside the asci are generally four or eight or a multiple of eight While these fungi live a parasitic life usually no asci are found and reproduction takes place mostly by blastospores and conidia The fungi belonging to this order are often pleomorphic their morphological characters changing according to the medium on which they live

The following families are of medical interest: *Saccharomycetaceae* *Endomycetaceae* *Gymnoascaceae* *Aspergillaceae*

FAMILY SACCHAROMYCETACEÆ Reess 1870

Definition — Vegetative cells single or loosely attached in irregular colonies mycelium not usually developed asci isolated not differentiated from vegetative cells each cell may develop into an ascus containing usually 1 to 4 rarely 12 ascospores

Classification — The family contains thirteen genera of which only four — *Saccharomyces* Meyen 1837 *Debaryomyces* Klocker 1909 *Zygoaccharomyces* Barker 1901 and *Hansenula* Sydow 1919 (*Willia* Hansen) — contain species parasitic on man

GENUS SACCHAROMYCES Meyen 1837

Definition — No proper mycelium Cells spherical ovoid or elongate Reproduction by budding and by ascospores Asci usually parthenogenic with 1 4 ascospores spherical or ovoid smooth Very occasionally spores copulate before germinating Gas fermentation of glucose and levulose and often of saccharose and other carbohydrates Occasionally rudimentary mycelial tubes present with transverse septation The type species is *Saccharomyces cerevisiae* Meyen 1897

Comparatively few members of this genus are pathogenic to man and the pathogenic species described are difficult to identify and determine We may mention *Saccharomyces blanchardi* and *S. granulatus*

SACCHAROMYCES BLANCHARDI Guirart 1906

Found in 1903 at an operation by Blanchard Schwartz and J Binot on a patient who had been considered to be suffering from tubercular peritonitis The fungus had produced in the peritoneum a large whitish gelatiniform mass weighing about a kilogramme Microscopically the organism was present in the shape of oval or roundish cells 1 5 to 20 μ in diameter some budding surrounded by a mucilaginous capsule

The fungus grew well on all sugar media

On maltose agar it produced crateriform colonies of a snow white colour Presence of asci with eight spherical spores On gelatine mucoid like colonies of greyish colour Slow liquefaction of the medium On potato mucoid growth whitish darkening after a long time On carrot growth viscid abundant pathogenic to rabbits in which it induced a general mycosis terminating fatally

Many authorities consider the fungus to be *Cryptococcus* vel *Torulopsis neoformans* Sanfelice

SACCHAROMYCES GRANULATUS Vuillemin and Legrain 1900

Observed by Vuillemin and Legrain in a tumour of the submaxillary bone Cells ovoid 4 5 μ in length and 3 4 μ in breadth Cul

tures pinkish or pinkish red ascospores and chlamydospores present Gelatine not liquefied Sugar reactions not given The principal characteristic of this saccharomyces is the cell membrane being covered with regular or irregular granulations The asci usually contain 2 or 4 ascospores It has been suggested that this organism was in reality *Cryptococcus* vel *Torulopsis neoformans* Sanfelice

GENUS HANSENULA Sydow 1919

Synonym — *Willia* Hansen 1904 not *Willia* Mull

Definition — Saccharomycetaceae with ascospores lemon shaped or bowler hat shaped In media containing sugars do not usually produce alcoholic fermentation but an ethereal fermentation with liberation of aromatic ethers hence cultures emit a pleasant fruity sweet odour Nitrates assimilated growth in ethyl alcohol Aerobic and facultative anaerobic Produce surface pellicle in liquid media Vegetative cells Gram positive ascospores often partially acid fast

Multiplication by sprouting with sprout cells (blastospores) often remaining close together forming chains

Type species — *Hansenula anomala* (Hansen 1891)

Synonyms — *Saccharomyces anomalus* Hansen 1891 *Willia anomala* Hansen 1904 *Saccharomyces beauietii* Froilano de Mello 1912

Has been isolated from beer milk cane sugar molasses margarine sputa faeces Cells oval or roundish $3.8 \times 2.5-6$ Pseudomycelium often found In sugar liquid media the fungus forms a well marked membrane containing air bubbles Optimum media for sporulation are carrot and prune agar Asci spherical with 2-4 spores typically cucullate of the so called bowler hat like type about 2μ in maximum diameter

Pathogenicity doubtful

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III Mycelium well developed —

I Asci formed after conjugation — *Eremascus*

II Asci formed asexually —

(a) Asci 4 spored — *Endomyces*

(b) Asci 8 spored — *Olema*

(c) Asci with a large number of spores — *Coccidioides*

(d) Asci with multiple tubercles in tissues — *Paracoccidioides*

(e) Asci with multiple tubercles in cultures — *Histoplasma*

At present *Paracoccidioides* and *Histoplasma* have been removed from the family and it is doubtful whether *Coccidioides* belongs to it but for convenience I propose leaving it in the family temporarily

GENUS ENDOMYCES Rees 1870

Definition — Endomycetaceae with mycelium abundant ramified or not simple or septate Asci with four spores Reproduction also by external spores blastospores and spores situated inside the mycelial tubes (endoconidia) in some cases

Remarks — Vuillemin believed at one time that the thrush fungus belonged to this genus Researches carried out by Castellani and Pinoy and others have demonstrated that the condition known as thrush is caused by fungi which do not reproduce by ascospores and as later stated by Pinoy and Vuillemin himself belong to the genus *Monilia sensu medico* (= *Candida*) For the fungus isolated once by Vuillemin which has all the characteristics of the genus *Endomyces* Landrieu suggested the term *Endomyces vuillemini* Landrieu 1912

GENUS COCCIDIROIDES Rifford and Gschrist 1896

Definition — Endomycetaceae which in the tissues have no mycelium appearing in the form of globular cells 3.80 μ in diameter

GENUS DEBARYOMYCES Kloeber 1909

Cells spherical small Vegetative reproduction by blastospores
 Asci formed by isogamous or heterogamous copulation occasionally parthenogenetic they contain only one ascospore which is spherical has a verrucose surface and often presents a central oil globule

A large number of species of *Debaryomyces* parasitic in man have been recorded but in practice their identification is most difficult A diagnostic key of the four more important species is the following —

- A Saccharose gas fermented —
 Growth on glucose agar white at first later bister or deep brown — *hudelei*
 Growth on glucose agar remains white or light coloured — *mucosus*
- B Saccharose not gas fermented —
 Glucose gas-fermented (slightly) — *kloeckeri*
 Glucose not gas fermented — *matruchoti*

This genus *Debaryomyces* might have become of great medical importance if the researches of Todd and Hermann (1936) and later other observers should have been confirmed These researches appeared at first to show that *Torulopsis* vel *Cryptococcus neoformans* (Sanfelice) was a *Debaryomyces*

FAMILY ENDOMYCETACEÆ

Definition — Mycelium generally well developed, multiseptate asci usually 4 8 spored spores one celled

At one time three genera of great medical interest were placed in this family viz *Coccidioides* *Paracoccidioides* *Histoplasma* and the following key was often quoted

- A ycelium poorly developed — *Podocapsa*

B Mycelium well developed —

I Asci formed after conjugation — *Eremascus*

II Asci formed asexually —

(a) Asci 4 spored — *Endomyces*(b) Asci 8 spored — *Oleina*(c) Asci with a large number of spores — *Coccidioides*(d) Asci with multiple tubercles in tissues — *Paracoccidioides*(e) Asci with multiple tubercles in cultures — *Histoplasma*

At present *Paracoccidioides* and *Histoplasma* have been removed from the family and it is doubtful whether *Coccidioides* belongs to it but for convenience I propose leaving it in the family temporarily

GENUS ENDOMYCES Rees 1870

Definition — Endomycetaceae with mycelium abundant ramified or not simple or septate Asci with four spores Reproduction also by external spores blastospores and spores situated inside the mycelial tubes (endoconidia) in some cases

Remarks — Vuillemin believed at one time that the thrush fungus belonged to this genus Researches carried out by Castellani and Pinoy and others have demonstrated that the condition known as thrush is caused by fungi which do not reproduce by ascospores and as later stated by Pinoy and Vuillemin himself belong to the genus *Monilia sensu medico* (= *Candida*) For the fungus isolated once by Vuillemin which has all the characteristics of the genus *Endomyces* Landrieu suggested the term *Endomyces vuillemini* Landrieu 1912

GENUS COCCIDIOIDES Rixford and Gilchrist 1896

Definition — Endomycetaceae which in the tissues have no mycelium appearing in the form of globular cells 3-80 μ in diameter

with a well defined double contour Inside the cells which ~~may be~~ by some authorities considered to be asci numerous endogenous roundish or ellipsoid spores form which become free on the dehiscence of the capsule In cultures abundant septate mycelium present asci usually absent no conidia

No trace of sexuality is noted but Ciferri and Redaelli and Castellani and Jacopo have reported isogamous conjugation

Types Species — *Coccidioides immitis* Rixford and Gilchrist 1896

Classification — Most authorities admit only one species *C immitis* others one species *C immitis* with several varieties According the latter hypothesis the classification would be as follows *Coccidioides immitis* var *immitis* *C immitis* var *louisianoideus* *C immitis* var *meteuropaeus* *C immitis* var *metamericanus* *C immitis* var *multifermentans* The last one is the only one which will probably remain either as a variety or a *forma biologica*

COCCIDIOIDES IMMITIS Rixford and Gilchrist 1896
(COCCIDIOIDES IMMITIS var IMMITIS)

Synonyms — *Coccidioides pyogenes* Rixford and Gilchrist 1896 *Megalocitosporides* Wernicke 1892 *Coccidium neoplasticum* Canton 1897 *Posadasia esferiformis* Canton in Posadas 1898 *Oidium coccidioides* Ophuls 1905 *Oidium protozooides* Ophuls 1905 *Zymonema immitis* Froilano de Mello and Fernandes 1918 *Mycoderma immitis* Verdun and Mandoul 1924 *Coccidioides esferiformis* Moore 1932 *Geotrichum immitis* Agostini 1932

Remarks — This fungus was discovered by Wernicke in Buenos Aires in 1892 in a patient affected with skin lesions somewhat resembling tuberculosis The study was completed by his pupil Posadas The organism was considered to be a protozoon In 1896 the same organism was found in a case in North America by Rixford

and Gilchrist and was called *Coccidioides immitis* by them. This organism is the causative agent of a very severe mycosis (Coccidioidosis, Wernicke's blastomycosis, *Coccidioides blastomycosis*). It has been found in South and North America (chiefly California) but closely allied species, probably strains of the same fungus, have been found in Europe by Castellani and Jacopo and others.

Description — In the tissues the fungus appears with characters given in the definition of the genus — vi — under the form of roundish bodies or «cysts» of various size $3-80\ \mu$ with a well marked double contour, some of them containing a large number of roundish or ellipsoid small spores, no mycelium. In cultures the fungus is easily cultivated on glucose agar and most of the other ordinary laboratory media; no asci are present while a large amount of mycelium is present without conidia. The growth on glucose agar is white or greyish white, occasionally of a fawn colour with a fluffy surface. On potato and carrot the colonies are usually white and fluffy. In glucose broth the fungus grows both on the surface and at the bottom of the tube. In hanging drop cultures abundant mycelium develops, no conidia. The usual average breadth of the mycelial threads is $2\ \mu$ with a maximum of 3 and minimum of 1.5. The threads are hyaline with no branching or very slight, at times collected in bundles, the hyphae being parallel to each other (coremia). The hyphae contain minute refringent granulations. Later arthrospores are formed, varying in length from 6 to $9\ \mu$ and easily separated. Some racquet mycelium is also often present. Large cystiform chlamydospores can be seen containing fat droplets. Their size is usually $5-8\ \mu$ but larger forms may be noted. No conidia are present. Milk is neither digested nor clotted; it is very often rendered alkaline. Gelatine and serum are liquefied rapidly within three or four days from date of inoculation. No gas and no acidity produced in any sugar and other substances tried, viz. glucose, levulose, maltose, galactose, saccharose, lactose, mannitol, glycerol, inulin, dulcitol, rhamnose, xylose, inositol, adonitol, arabinose, amygdalin, salicin, sorbitol, raffinose, dextrin, erythritol. Endosporulation may occasionally take place in culture when the fungus is grown under anaerobic conditions in ascitic fluid or in gelatine containing pieces of tissue.

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A Ascomycetes type —

With perithecia and asci — Tribe 1 *Gymnoascaceae* Castellani and Chalmers 1919

B Fungi imperfecti type —

Without perithecia or asci on ordinary media Reproduction asexual by mycelial and conidial spores — Tribe 2 *Trichophytoneae* Castellani and Chalmers 1918

The first tribe includes the genera *Myxotrichum* Kunze 1823 *Gymnoascus* Baranetky 1872 *Ctenomyces* Eidam 1880 *Amourosus* Schroeter 1893 *Arachniotus* Schroeter 1893 and *Eidamella* Matruchot and Dassonville 1901 but these are not directly concerned with tropical medicine The second tribe is of great medical importance as it contains the ringworm fungi

TRIBE TRICHOPHYTONEÆ Castellani and Chalmers 1919

Classification — The tribe Trichophytoneae contains 5 genera *Microsporum* Gruby 1863 *Trichophyton* Malmsten 1845 *Epidermophyton* Lang 1829 *Achorion* Remak 1845 *Endodermophyton* Cast 1911 The last two have been merged in the genus *Trichophyton* by many authorities

GENUS MICROSPORIUM Gruby 1863

Macroconidia (closterospores) multiseptate conidia «fuseaux» and microconidia present in cultures Macroconidia fusiform with surface showing minute hair like asperities microconidia usually not very abundant sessile Two principal species —

- 1 — Found in man not in animals colony with satiny aspect and several grooves radiating from the centre *M. Audouinii* Gruby 1843

Pathogenicity — Causes Coccidioidomycosis or Posadas Disease
Coccidioides immitis Rixford and Gilchrist var *multifermentans* Cast

Synonym — *Geotrichum multifermentans* Cast 1933 This fungus grows well on all ordinary media On glucose agar the growth is usually fluffy and is of a white whitish grey or greyish brownish colour Gelatine and serum are not liquefied at least not within the first fifteen days from date of inoculation The growth on mannitol agar does not show a definite pigmentation of the medium In hanging drop cultures (peptone water) a large amount of mycelium is present no conidia or asexual conidia are seen The width of the hyphae varies between 2 and 4 μ Arthrospores may be observed also chlamydospores

Fermentation Reactions — It produces within ten days distinct acidity (never gas) in a large number of carbohydrates viz Glucose Levulose Maltose Galactose Saccharose Lactose Mannitol Glycerol Inulin Dulcitol Rhamnose Inositol Adonitol Arabinose Amygdalin Salicin Sorbitol Raffinose Dextrin Erythritol Xylose

This fungus is probably merely a forma biologica of *Coccidioides immitis* Sugars are never acidified by the typical *immitis*

FAMILY GYMNOASCACEÆ Baranetzky 1872

Definition — Peridium composed of loose hyphae at the extremities of which the asci are situate or without perithecial or ascal formation and reproducing (as far as is known) as a rule by mycelial or conidial spores

Type Genus — *Gymnoascus* Baranetzky 1872

Classification — From the definition given above it is obvious that the family is capable of being divided into two tribes as follows —

GENUS EPIDERMOPHYTON Lang 1879 em Sabouraud 1917

Macroconidia abundant claviform smooth microconidia absent

Only one species colony showing a canary yellow tinge —

E. floccosum Harz the cause of Tinea cruris

GENUS ACHORION Remak 1845

On ordinary media macroconidia and microconidia absent practically only mycelial hyphae Only one species *A. schoenleinii* causes favus

GENUS ENDODERMOPHYTON Castellani 1910

On ordinary media only mycelium and microscopically and culturally closely resembles *Achorion* but biologically very different giving rise to Tinea Imbricata a disease totally different from favus no two diseases could clinically be more different

It is generally stated that there is only one species *concentricum* R Blanchard This is however in reality a *nomen nudum* as Blanchard merely gave the name *en passant* without any description microscopic or cultural (the fungus had not yet been cultivated)

In my opinion the correct nomenclature is *Endodermophyton tropicale* Cast 1910 — with two varieties *tropicale* and *indicum*

FAMILY ASPERGILLACEÆ

Two genera of medical importance *Aspergillus* Micheli 1729 and *Penicillium* Link 1809

GENUS ASPERGILLUS Micheli 1729

Conidiophore terminates in a roundish or ovaloid expansion supporting numerous claviform structures each of which abstracts at its apex a chain of conidia (basipetal formation)

- 2 — Man gets infected from animals and man colony with fluffy aspect lanuginous or at times cottony — *M. felineus*
C Fox & Blaxall 1896 (= *canis* = *lanosum*)

GENUS TRICHOPHYTON Malmsten 1845

Macroconidia and microconidia present macroconidia somewhat claviform with smooth surface Microconidia often abundant pedicellate at times in clusters «en grappe»

Numerous Species — A simple scheme suggesting in practice the chief ones is the following

1 Colony not definitely pigmented

- | | | |
|---|---|--|
| 1 | Crateriform | <i>T. tonsurans</i> Malmsten 1845 |
| 2 | Acuminate | <i>T. sabouraudi</i> Blanchard 1895 |
| 3 | With numerous radiating tapering extensions at periphery pyogenic | <i>T. mentagrophytes</i> Ch Robin 1853 |
| 4 | Cottony or woolly aspect found in tinea pedis | <i>T. pedis</i> Ota 1928 (= <i>interdigitale</i>) |

2 Colony definitely pigmented

- | | | |
|---|--|---------------------------------|
| 1 | Violaceous | <i>T. violaceum</i> Bodin 1902 |
| 2 | Red or purplish red | <i>T. rubrum</i> Cast 1909 |
| 3 | Rusty colour | <i>T. ferrugineum</i> Ota |
| 4 | Reddish centre surrounded by sulphur yellow zone | <i>T. sulphureum</i> C Fox 1908 |
| 5 | Chestnut colour | <i>T. batonrougei</i> Cast 1934 |
| 6 | Greyish blackish fluffy thin mycelium | <i>T. tenuishypha</i> Cast 1939 |

GENUS *ACTINOMYCES* SUBGENUS *NOCARDIA*

Aerobic Numerous species among which *asteroides madurae pellettieri* which are often found in cases of Madura Foot or Mycetoma (*Actinomycetoma*)

Other Species — We may mention *A. minutissimus* found in *Erythrasma* and *A. tenuis* found in trichomycosis

ORDER 2 THALLOSPORALES Vuillemin 1910

Reproduction by means of thallospores

Classification — This order may be divided as follows —

Reproduction by means of the form of thallospore called blastospore —

Suborder 1 *Blastosporineae* Vuillemin 1911

Reproduction by means of the form of thallospore called arthrospore —

Suborder 2 : *Arthrosporineae* Vuillemin 1911

SUBORDER BLASTOSPORINEAE Vuillemin 1910

The genera of medical importance are *Cryptococcus* Kützing 1838 *Pityrosporum* Sabouraud 1895 *Candida* Berkhout 1935 *Geotrichoides* Langeron and Talice 1932 *Hormodendrum* Bonorden 1851 *Cladosporium* Link 1816 *Malassezia* Baillon 1889

Genus *Cryptococcus* Kützing 1833 (*Torulopsis* Berlese 1894 em Ciferri 1925)

Only budding cells present no mycelium

Principal species — *Cryptococcus neoformans* (Sanfelice) causes European Blastomycosis (Busse Buske disease)

GENUS *PENICILLIUM* Link 1809

Absence of roundish or ovaloid expansion The conidiophore ramifies into verticillate branches supporting sterigmata each of which abstracts a chain of conidia (basipetal formation) The whole of the fruit body resembles a hairbrush hence the name *penicillium*

CLASS IV · *FUNGI IMPERFECTI* (*Adelomycetes*)

The fungi of this class reproduce as far as we know only by asexual spores Many of them are of great medical interest

The class contains two orders —

Mycelium very thin 1 micron or less —	{	Order 1 Microsiphonales
		reproduction by thallospores —
		Order 2 Thallosporales
Mycelium larger than 1 micron	{	reproduction by hemispores —
		Order 3 Hemisporales
		reproduction by conidia —
		Order 4 Conidiosporales

ORDER 1 : MICROSPHONALES Vuillemin 1912

For simplicity we admit only one family *Actinomycetaceae* with one genus *Actinomyces* Harz 1877 with the general characters of the Order and with 2 subgenera *Actinomyces* anaerobic and *Nocardia* aerobic

GENUS *ACTINOMYCES* SUBGENUS *ACTINOMYCES*

Anaerobic only one species *A. Israeli* Kruse 1896 which is the cause of the classical actinomycosis with sulphur yellow or white yellowish grams

GENUS GEOTRICHUM Link 1809

h Only arthrospores no blastospores

GENUS TRICHOSPORUM B hrend 1890

Similar to Geotrichum but parasitic on hair

Principal species — *T giganteum* (Behrend 1890)

Causes white piedra

GENUS MADURELLA B umpt 1905

Cultures of black colour (causes a black variety of mycetoma)

GENUS INDIELLA E Brumpt 1906

Causes a variety of white mycetoma Not cultivated

ORDER III HEMISPORALES Vu illem 1910

Fungi imperfecti reproducing by hemispores Only one genus *Hemispora* Vuillemin 1906 with only one species *Hemispora stella* Vuillemin 1906

ORDER IV CONIDIOSPORALES V illem 1910

Fungi imperfecti reproducing by conidia Principal genera *Acladium* Link 1809 *Aleurisma* Link 1809 *Glenospora* Berkley and Curtis 1876 *Sporotrichum* Link 1809 *Scopulariopsis* Baurier 1907 *Monosporium* Bonorden 1851

Acladium Link 1809 — Conidia (aleuroconidia) pleurogenous being found only on the sides of the hyphae not apical usually sessile never in clusters

GENUS PITYROSPORUM Sibouraud 1904

Budding cells of very small dimensions no mycelium

Principal species — *Pityro porum otale* Bizzozzero 1882

GENUS CANDIDA Berkhout 1935 Em Langeron and Guerra 1928

Buddings cells and pseudomycelium present

GENUS GEOTRICHOIDES Langeron and Talice 1932

Blastospores arthrospores pseudomycelium true mycelium present

Principal species — *G. cutaneus* de Beurmann Gougerot and Vaucher 1909

GENUS CLADOSPORIUM Link 1816

Cultures black blastospores conidia present mycelium present
Formation of chains by apical budding

Important species — *Cladosporium pedrosoi* (= *Hormodendrum pedrosoi*) *Cladosporium mansonii* (Castellani) Pinoy The first is the causer of Chromoblastomycosis the second of Acladiosis

GENUS MALASSEZIA Baillon 1889

Not cultivated many free spores arranged in grape like clusters
Type species — *Malassezia furfur* (Ch Robin 1852)

SUBORDER ARTHROSPORINEÆ Vuillemin 1911

Thallosporales reproducing by arthrospores

culide of the skin After Gilchrist and Stoke's case other cases of blastomycosis due to an identical or similar organism were described by Hyde Oppenheim Ricketts and many others Ricketts considered these fungi to be species of *Oidium* and proposed the name *oidiomycosis* to indicate the disease produced by them They cause North American blastomycosis (Gilchrist's Diseases)

C. dermatitidis in the affected tissues has the appearance of a typical yeast — i. e. large globular cells 10 to 16 μ in diameter well marked double contour some budding In cultures at room temperature which are at first usually white besides these globular elements mycelial tubes develop presenting lateral or terminal conidia asci are absent The fungus does not gas ferment sugars and there is no formation of a pellicle in liquid media

BLASTOMYCES (PARACOCIDIODES) BRASILIENSIS

(Splendore 1912)

Synonyms — *Oidium brasiliense* Splendore 1912 *Zymonema brasiliensis* Splendore 1912 *Zymonema histoporo-cellularis* Habersfeld 1912 *Mycoderma brasiliensis* Brumpt 1922 *Coccidioides brasiliensis* de Almeida 1929 *Monilia brasiliensis* Vuillemin 1931 *Coccidioides esferiformes* Moore 1932 *Coccidioides histoporo-cellularis* Fonseca 1932

Remarks — This fungus was first seen by A. Lut in 1908 It was cultivated and fully described by Splendore in 1912 who called it *Zymonema brasiliensis* It is the causative agent of the oropharyngeal type of blastomycosis occurring in South America

Description — In the tissues the fungus appears with the characters given in the definition of the genus Large globular bodies are seen up to 30-40 in diameter which may be Gram positive or Gram negative surrounded by small coccoid bodies about 1 μ in diameter which are strongly Gram positive The large globular bodies were considered to be asci budding out spores about the periphery until the dense protoplasm is used up Somewhat yeast like roundish bodies 5-10 in diameter at times larger at times smaller with a well marked

Aleurisma Link 1899 — Conidia (aleuroconidia) — acro pleurogenous Those on sides of hyphae usually not pedicellate but attenuated at points of insertion Terminal clusters present

Species of medical interest *Aleurisma albiscicans* (Nieuwenhuis 1907) *Aleurisma castellanii* Pinoy 1916 *Aleurisma orientale* Castellani & Iacono 1934

Sporotrichum Link 1809 — Conidia (radulospores) on sides of hyphae pedicellate and when they become detached the supporting pedicelli remain Terminal and lateral clusters present

Monosporium Bonorden 1851 — Each sporofore bears one single conidium at its apex

Important species — *M. apiospermum* Saccardo causes a variety of mycetoma

Glenospora Berkley & Curtis 1876 — Conidia acro pleurogenous some in chains (basipetal formation) Species of medical interest *G. graphii* Siebenmann 1889 *G. khartoumensis* Chalmers and Archibald 1916 *G. lanuginosa* Cast 1930

Scopulariopsis Bainier 1907 Resembles *Penicillium* Conidia borne on phialides chains basipetal Species of medical interest *S. blochi* Matruchot 1911

INCERTÆ SEDIS

Some of the fungi of importance in tropical medicine are of very difficult classification and have to be described under the heading *Incertæ sedis*

I will touch very briefly upon the following *Blastomyces dermatitidis* Gilchrist & Stokes *Blastomyces (Paracoccidioides) brasiliensis* (Splendore) *Histoplasma capsulatum* *Piedraia Hortai*

BLASTOMYCES DERMATITIDIS Gilchrist and Stokes 1898

Synonyms — *Cryptococcus gilchristi* Vuillemin *Zymonema gilchristi* de Beurmann and Gougerot

Found by Gilchrist and Stokes in a case of chronic ulcerative dermatitis and later in a case which had been diagnosed as a tuber

culide of the skin. After Gilchrist and Stokes' case other cases of blastomycosis due to an identical or similar organism were described by Hyde, Oppenheim, Ricketts and many others. Ricketts considered these fungi to be species of *Oidium* and proposed the name *oidiomycosis* to indicate the disease produced by them. They cause North American blastomycosis (Gilchrist's Disease).

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double contour may also be present in the pus and tissues occasionally showing typical budding. Cultivation is rather difficult. The best medium to grow the fungus from the lesions is ordinary agar (pH 7.4). The growth is often cerebriform, yellowish, somewhat resembling *Achorion schoenleinii*. On this medium the organism develops in the form of round yeast-like cells only, but on glucose agar mycelium develops with typical conidia. The cultures on maltose and glucose agar are greyish white and some cottony-like aerial mycelium may be present at times. None of the ordinary carbohydrates is acidified or gas-permented.

Pathogenicity — Pathogenic to guinea pigs by intratesticular injection but only local lesions develop. The fungus injected in these animals intraperitoneally does not cause any lesion. It will be remembered that *Coccidioides immitis* inoculated intraperitoneally on the other hand produces a generalized infection which kills the animal. White mice are infected with great difficulty.

HISTOPLASMA CAPSULATUM Darling 1906

Synonyms — *Cryptococcus capsulatus* Castellani and Chalmers 1918. *Grubiyella capsulata* Ota 1928. *Torulopsis capsulata* Almeida 1933. *Pesadasia capsulata* Moore 1934.

Remarks — This organism was discovered by Darling in 1906 at the autopsy of a patient who had been suffering from febrile splenomegaly clinically resembling kala-azar. The organism was present in the endothelial cells of capillaries and small bloodvessels in the spleen, liver, intestine, lungs and lymph glands as well as in the leucocytes. Darling and many other observers after him considered it to be a protozoon. Darling creating for it the genus *Histoplasma*. It was first cultivated by W. A. De Monbreun.

Description — In the affected tissues the organism is present in the shape of intracellular roundish or oval bodies measuring 1-4 μ in diameter and enclosed in an achromatic refractile capsule. A few bodies generally in the spleen may be extracellular and may be

budding. The parasite is found principally in the large endothelial cells of the spleen, lymphatic glands, lungs, liver and intestine. It is present in large numbers in the form of small oval or roundish bodies which on superficial examination have some resemblance to *Leishmania* but do not show any blepharoplast and possess a well defined capsule and moreover some parasites are budding. They are usually 2 or 3, occasionally 4μ in length, $1.5-2\mu$ or a little more in breadth. The chromatin in the cytoplasm is arranged irregularly. There are also parasites which are extracellular and are then larger and are surrounded by a clear area or halo which probably represents a colourless mucinoid capsule; possibly this halo may not be a definite capsule produced by the organism but a reaction product of the surrounding tissue.

In cultures the organism is found under two forms: a coccoid-like form when grown on blood and serum media at 37°C and subcultured very frequently a filamentous form on other media. In the filamentous type the hyphae are septate, multinucleate, 1.5μ in diameter. Racquet mycelium may be present. Lateral conidia are often seen, spherical or pyriform, sessile or pedicellate, 2.8μ in maximum diameter. Chlamydospores may be present, $3-10\mu$ in diameter, singly or in chains, intercalary or lateral, seldom terminal. Asci were described and therefore the fungus was at one time placed among the Ascomycetes.

PIEDRAIA HORTAI (Brumpt 1913)

Synonyms — *Trichosporum hortai* Brumpt 1913; *T. paraguayum* Delamare and Gatti 1928; *Piedraia sarmentoi* Pereira 1930.

The fungus forms hard black nodules on hair (Black piedra). The microscopical examination of the nodule after treating with liquor potassae shows presence of a large number of septate mycelial filaments and segments of filaments close together and presence of ovoid asci each containing four or eight elongated ascospores. On Sabouraud's maltose agar colonies are dark brown, very adherent, later becoming folded and eight to ten weeks after inoculation the colour of the whole growth is quite black. Mycelial hyphae are septate, 12μ in diameter, slightly brownish, thick walled. Asci are seen with difficulty, ascospores elongated, fusiform, $30\times 10\mu$, slightly

curved of a greenish yellow colour each pole of the ascospore has a filiform appendage about $30\ \mu$ long but may be much shorter

Medical men interested in mycology should read and study some books dedicated only or principally to that science among which the following excellent ones Langeron and Vanbreuseghem Précis de Mycologie Paris 1952 Brumpt Précis de Parasitologie Paris 1947 Conant Martin Smith Baker and Calloway Clinical Mycology Philadelphia 1954

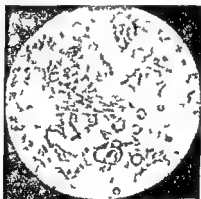
My old monograph on Fungi and Fungous Diseases Amer Med Ass Chicago 1927 may still occasionally be found useful

CRYPTOCOCCOSIS EPIDERMICA

(Blastomycosis epidermica)

Synonym — Saccharomycosis epidermica

History and Geographic Distribution — Many years ago while in Ceylon I noticed on the skin of one of my bungalow servants



Scraping from a case of cryptococcosis epidermica fusca
Note cryptococcoid bodies (*Crypta occus* vel *Torulopsis epidermidis*)

several brownish dirty looking patches which looked very much like dirt. He told me however that they did not disappear when soap was used. I made a scraping and saw the patches consisted of a large number of budding cells which I believed to be saccharomyces

I found the same patches not only in other natives but also in Europeans especially on the chest and arms and called the condition «saccharomycosis epidermica» which term I changed later into «cryptococcosis epidermica» I did not succeed in growing the fungus Chalmers and others have confirmed my observations in the Sudan and North Africa and fairly recently Amalfitano in Italy but the organism has not yet been cultivated Amalfitano's paper is an excellent one (La cryptococcosi epidermica di Castellani Giorn Italiano di Dermatologia 1942 fasc No 1)



Cryptococcus epidermica

A short general account of the condition may be found in Castellani and Chalmers Manual of Tropical Medicine London 1919 pag 2092

Etiology — The causal organism is *Cryptococcus (el Torulopsis epidermidis* Castellani 1914 It appears in the lesions under the form of large (5.7 microns in diameter and more) roundish or ovaloid cells occasionally budding which have so far not been cultivated

Symptomatology — The condition is fairly frequent in natives and Europeans who have resided for many years in the tropics It is characterized by the presence on the arms and more rarely on the

chest and neck of small roundish dirty yellow occasionally golden yellow or brownish patches which can generally be removed by thorough scraping. These patches consist of large numbers of blastomycetes like elements of various sizes rounded or oval which have so far not been cultivated.

Treatment — Ordinary soap does not remove the patches but thorough scraping with sand soap and hot water is generally sufficient to remove them. In obstinate cases salicylic acid alcoholic lotions (2-4%) and ■ salicylic sulphur ointment are useful.

Cryptococcosis Epidermica Alba and Rosea — White patches consisting solely of yeast like fungi without inflammatory signs are occasionally seen especially in natives. I have several times grown the fungi which belong to the genera *Candida*, *Torulopsis*, *Saccharomyces*. In a case with pinkish patches a *Torulopsis* (*Cryptococcus*) was present which when cultivated on laboratory media gave rise to pink colonies.

PARONYCHIA ACTINOMYCETICA VEL NOCARDIACA

As well known there are four common types of paronychia: 1) due to the ordinary pyococci: chiefly *Micrococcus pyogenes* var. *aureus* and var. *albus*; *paronychia pyogenica* vel *septica*; 2) due to trichophyton fungi; *paronychia trichophytica*; 3) due to yeast like fungi usually of the genus *Candida* (*Monilia* sensu medico) generally *C. albicans* var. *pinoyi* and *C. albicans* var. *metatondinensis* occasionally *C. tropicalis*; *paronychia moniliaca*; 4) due to fungi of the genus *Mucor* and allied genera very less frequent than the previous ones but fairly common in California especially among fruit handlers — *paronychia mucorinica*. The *mucor* found in the Californian cases is *Mucor paronychius* Sutherland, Campbell & Plunhett 1934 probably a variety of *M. racemosus*.

A fifth type may now be added due to fungi of the genus *Actinomyces* subgenus *Nocardia* (aerobic) *paronychia actinomycetica* vel *nocardica* of which I have investigated two cases. The condition is

clinically identical with *paronichia moniliaca* (*paronichia candidiaca*) the nail fold being swollen painful and tender. In one of the cases a few transverse blackish lines were seen on the nail plate. From both cases a fungus was isolated very thin (about one micron) non-motile branching Gram positive Ziehl negative not liquefying gelatin within two weeks developing well on glucose agar on which it produces a slightly knobby growth with a chalk white powdery surface later the submerged portion of the growth darkens and the medium also may darken. The fungus gives off a musty odour the same as is so often noticeable in many wood and the same as given off by several other aerobic actinomyces fungi and especially by *Actinomyces odoriferus*.

Quite recently I had a case of mixed infection the *Actinomyces* fungus described above + *Candida albicans* var *pinoyi*.

The course of the affection appears to be extremely long lasting for several years.

Actinomyces odoriferus Cast 1933 — Isolated first from a dermatitis resembling erythrasma but more pruriginous affecting the allyl region of a coloured woman in New Orleans. Cultures on agar and gelatin give a strong odour comparable to that of eable wood. Gram positive not acid fast. Gelatin and serum very slowly liquefied. Litmus milk decolored not lotted or digested. Does not produce acidity or gas on any of the carbohydrates and other carbon compounds tested — viz glucose laevulose maltose dulcitol rhamnose arabinose inositol amygdalin salicin sorbitol raffinose dextrine erythritol xylose adonitol. Possibly a variety or strain of *A. album* Rossi. Doña 1891.

Treatment — I recommend the methods of treatment I use as a routine in *paronichia moniliaca*. If the patient does not object to the reddish discolouration simply advise him to place the tips of the affected fingers in the so called Castellani's tincture ten minutes in the morning and ten minutes at night. If the patient objects to the discolouration the following treatment may be used the affected fingers should be soaked for ten minutes morning and evening in a bowl of tepid water to which 1-3 teaspoonfuls are added of a powder consisting of methyl salicylate grm 0.60 acidum boricum grm 30 alum grm 30. At night after this procedure an ointment is applied regularly with the following formula ichthyol grm 1 boric acid grm 1 vaseline grm 30. A light bandage may be applied.

INTERTRIGO MONILIACA (INTERTRIGO BLASTOMYCETICA)

Synonyms — Intertrigo saccharomycetica intertrigo cryptococica intertrigo endomycetica intertrigo candidiaca intertrigo mycetica

Intertrigo blastomycetica was first described by me in Ceylon in 1907 an account of it may be found in all the editions of Castellani & Chalmers *Manual of Tropical Medicine* (p 2092) In Europeans the affected skin — usually the skin of the inguinal regions — is reddened and there may be a slight exudation and the surface may take a sodden appearance the border of the eruption may be fairly well marked but it is not distinctly raised In coloured patients the patches may appear whitish when the fungi are present in enormous amount as is often the case In many cases there is not much itching In a case in scrapings I found a true yeast which I called in 1907 *Saccharomyces samboni* In the great majority of cases organisms are found of the genus *Candida* (*Monilia*)

The simplest treatment is the application of the fuchsin paint Good results can be obtained also by using a 2 per cent gentian violet paint

TINEA NIGRA

Tinea nigra is characterized by the presence of jet black patches caused by a fungus of the genus *Cladosporium* which I called *C. mansonii* in honour of Sir Patrick Manson A detailed description of it may be found in Castellani and Chalmers *Manual of Tropical Medicine* 2nd edit 1913 It often affects the palms of the hands The fungus is fairly easily grown on sugar media giving rise to black colonies Europeans may contract this mycosis as well as natives

A European medical man went to Burma from Ceylon in 1911 for a pleasure trip On returning to Ceylon he noticed a roundish slightly elevated black spot on the palm of his left hand The spot slowly increased in size for two months becoming the size of a halfpenny piece A single application of formaldehyde made it disappear but three months later it reappeared The second application of formaldehyde made it disappear permanently Cultures were made from

LITTLE KNOWN TROPICAL

the patch before treatment
case was quoted and described
Castellani and Chalmers Manu
pag 2079

Tinea nigra occurs also in
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Some more detail on *Tinea nigra*
the development is given in some b

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The fungus grows well though less abundantly on the other sugar agars and also on ordinary agar In broth and peptone water the growth is very slow and takes place at the bottom of the tubes with formation of a black or greenish black sediment Gelatine is at times very slowly liquefied

The microscopical examination of cultures shows presence according to Pollacci and Nanni of some olivaceous hyphae very little branching terminating in rows of roundish arthrospores 2.5 micron in diameter

The optimum temperature for the growth of the fungus is between 30 and 32 C above 35 C and under 25 C the growth is much slower and may be nil under 20 C

Definition of Genus Cladosporium Link 1816 — *Botanical Definition* — *Cladosporiaceae* vs *Blastosporales* with hyphae manifest and distinct from the conidia which are either solitary or arranged in short chains — with conidia smooth not capitate more or less in chains at first Hyphae and conidia uniform Hyphae not inflated but decumbent conidia (blastoconidia blastospores) in short chains produced by apical budding and finally solitary

TINEA NODULARIS

This is not a common condition but I have seen three cases of it The usual lesions of tinea rings and plaques are absent On the legs exceptionally on the body several most pruriginous nodules the size of a large pea to a small cherry are seen

The surface of the nodule may be granulomatous and covered by crusts. If repeated examinations are carried out trichophyton like fungi are found.

The local application twice a day of the fuchsin paint is the best treatment.



Tinea nodularis

FURUNCULOSIS CRYPTOCOCCICA (FURUNCULOSIS BIASTOMYCETICA, FOLLICULITIS DECALVANS CRYPTOCOCCICA)

Some years ago I described a peculiar type of mycosis indistinguishable clinically from the ordinary furunculosis which I called at the time «furunculosis cryptococcica» and as the condition in the first two cases principally affected the scalp under the form of a purulent folliculitis and loss of hair I suggested for it also the term «folliculitis decalvans cryptococcica».

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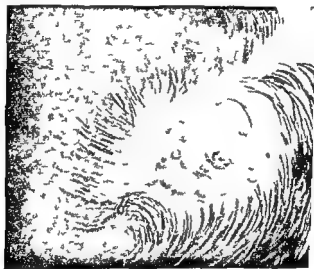
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Etiology — The fungi found are yeast like and it is difficult to decide whether they belong to the genus *Torulopsis* (*Cryptococcus*) or the genus *Candida* (*Monilia*). One of them (*Candida* vel *Torulopsis* vel *Cryptococcus castellani* Re) has been fairly completely investigated. Its cultures on glucose agar are pinkish. It produces a slight amount of gas in glucose, levulose and mannose.

By some authorities it has been identified with *Torulopsis pulcherima*, a common yeast like organism found on flowers and in soil and its pathogenicity has been doubted.



Paronychia and folliculitis cryptococcica

The fact that the fungus may be a common saprophyte of flowers and fruit does not exclude the possibility of its being pathogenic to man. It is sufficient to remember *Torulopsis neoformans*, a saprophyte of fruits which gives a deadly disease in man, the blastomycosis of Busse-Buske. The strains of fungus isolated from the Indian cases are somewhat different from the organism grown from the English cases and differ also though slightly among themselves.

Symptomatology — The clinical picture of this blastomycosis is totally different from the usual types of blastomycosis cutis which

are characterized by the presence of patches with vegetating papillary excrescences which give them a characteristic verrucose or frambesi form appearance. Furunculosis blastomycetica is clinically indistinguishable from ordinary severe furunculosis. Boils indistinguishable from ordinary boils may be present on the face and body but the region mostly affected as a rule is the scalp. In this region numerous pustules flattened or conical each pierced by a hair may be seen in addition there may be infiltrated lesions which somewhat resemble flat carbuncles and later open and discharge through several openings.

The hair in the affected areas falls off and patches of baldness sometimes permanent remain.

Paronichia due to the same fungus may be present.

ILLUSTRATIVE CASE

Mr D married aged 34 a Dan who had lived in London for twelve years preceded admission was fond of all outdoor sports and was a famous football player. The condition had started a few years previously to his being seen by me with the appearance of follicular pustules on the scalp and two or three furunculoid lesions on the forehead and face.

Later extremely painful carbuncle like lesions developed. A bacteriological examination of the pus was made at the well known laboratory in London and *Staphylococcus aureus* was found. Autogenous staphylococcal vaccine and also a stock vaccine were given for a time without any benefit. On the advice of his medical attendant the patient then came to consult me.

Apart from a boil on the left forehead and one on the supraorbital region all the lesions were on the scalp and the patches of baldness. The skin was smooth and whitish were plainly visible there were also numerous follicular pustules some flat some conical and most of them surrounded by a zone of hyperemia. The most extremely painful carbuncle like lesion was one not yet opened and the other with several openings discharging were present. I made a bacteriological and mycological examination. Microscopically the pus contained only Gram positive cocci. The de trope agar test was moulded with the powdered band at growth of *Staphylococcus* and microscopically here and there a yeast like cell in water. It was

After plating and replating the yeast like organism was identified as *Candida albicans*. Later I grew the same fungus from a number of lesions some of which were unopened. It was *Toxoplasma* (*Cryptococcus*) or *Candida albicans* with the following principal characteristics: cultures on dextrose agar were abundant with a smooth surface at first white and later yellowish and later yellowish pinkish. The fungus did not produce any gas on any carbohydrate it first later it produced production of gas in dextrose and levulose. It was agglutinated by the patient's blood in high dilution (1 in 400). An interesting point arises which organism was the

true causative agent of the condition the cryptococcus or the staphylococcus? In my opinion it was the cryptococcus for the following reasons staphylococcus vaccines did not have any beneficial action whatever The cryptococcus was agglutinated by the patient's blood and the condition improved and finally disappeared on a treatment consisting of massive doses of potassium iodide given internally It is well known that potassium iodide not only does not have any beneficial action on *Staphylococcus furunculosis* but also makes it much worse

Diagnosis — The diagnosis can be made only by mycological methods In all cases of persistent furunculosis that do not answer to staphylococcus vaccine sulphonamides and antibiotica the possibility of furunculosis blastomycetica should be kept in mind

Prognosis — The disease does not have a tendency to spontaneous cure

Treatment — Potassium iodide in very large doses (4.8 grms daily) given for long periods often induces a cure A vaccine prepared with the fungus seems to be useful but alone is not sufficient to bring about a cure

TINEA TENUIS

This is a rare condition The patient — all my cases were women — complains of severe pruritus usually on the dorsum of the hands and forearms

On casual superficial inspection one sees nothing but on close examination one notes the presence of one or several roundish or oval hardly visible patches composed of many minute papules From these cases a fungus was isolated characterized by its thin mycelium I called it *Trichophyton tenuishypha* It is possible however that the fungus is not a trichophyton I still have cultures of this fungus and will be pleased to send them to any colleague interested in the subject A description of it was given in the Journal of Tropical Medicine and Hygiene December 15 1939

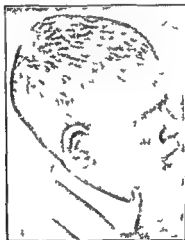
The best treatment is the application of the fuchsin paint Tincture Iodol also gives good results

TINEA DECALVANS PERSTANS

(La — Li — Tou)

Synonym — La — li — tou pro parte

Years ago in Ceylon I described a peculiar trichophytic disease of the scalp that causes permanent baldness. The scalp presents one



Tinea decalvans perstans (Ceylon case)

or several white patches covered with an enormous number of heaped up white psoriasisic scales. After a time the scales disappear and smooth bald patches remain permanently. A certain amount of scarring may be present but in my experience never so marked as in favus.

The scales and broken hairs examined microscopically show the presence of a trichophyton which when cultivated closely resembles *Trichophyton violaceum* of Bodin.

I called it *T. violaceum* variety *decalvans* as the patches remain permanently bald. The condition is common also in China as shown

by Ota (Br Journ Derm & Syph Vol XLIV 1922 Castellani & Chalmers Manual of Tropical Medicine 1919)

The traveller in Southern China is often surprised at the number of natives affected with baldness. Baldness has been studied by Chinese medical men for centuries. In the famous Chinese medical book «Bin — yuan — lu» (605-609 A. D.) three types of alopecia are discussed: the white alopecia, the red alopecia and the demon-like alopecia (perhaps alopecia areata).

At present the Chinese use the term *la — li — tou* to indicate baldness in general but principally the types of parasitic origin. Ota has found that this term covers favus and tinea decalvans. He believes that at least biologically *T. violaceum* variety *decalvans* differs from the typical *T. violaceum*.

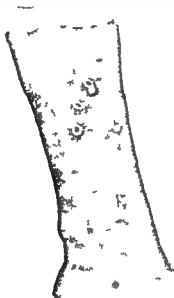
It must be stated however that in recent years it has been found by me in Ethiopia and in Morocco by Langeron that apparently also typical strains of *T. violaceum* produce at times permanent cicatricial alopecia. In addition Langeron has found also in North Africa that *T. violaceum* may produce favus-like scutula (Precis de Mycologie Paris 1945 p. 537).

TINEA INTERSECTA

This dermatomycosis and its fungus were first described by me in 1907. A fairly complete account of it with a coloured plate may be found in Castellani & Chalmers Manual of Tropical Medicine all editions (London 1910 1913 1919). It occurs in Ceylon and Southern India.

Etiology — If a portion of one of the brown patches or a scale be removed and treated with liquor potassae the fungus is easily detected. The fungus (*Endodermophyton castellanii* Perry 1907) grows between the superficial and the deep strata of the epidermis. It is present on the inner surface of the scales but not on the external surface. A very remarkable fact is the extreme rarity of free arthrospores: in fact in several cases one does not succeed in finding any. The mycelium is fairly abundant though far from being so abundant as in tinea imbricata. It is composed of long straight

articulated threads which are sometimes dichotomous the breadth being between 3 and $3\frac{1}{2}$ microns Each segment presents in fresh preparations two refractile bodies one at each extremity No aspergillar fructifications nor clusters of spores are seen Attempts at growing the fungus have succeeded only in one case the growth being somewhat similar to that of *Endermophyton indicum* Castellani



Tinea intersecta (Ceylon case)

which causes a variety of *Tinea imbricata* (see Castellani & Chalmers Manual of Tropical Medicine 1919 pag 2069)

Symptomatology — The eruption begins with small oval or roundish very slightly elevated itching patches generally situated on the arms legs chest and back The margins of these dark spots are at first slightly elevated and dotted often with minute dark papules The patches are dark brown in colour much darker than

the surrounding skin and present a smooth tense surface at first they increase in size slowly and some coalesce. After a certain time the surface of the patches is no longer tense it becomes somewhat shrivelled and dry superficial cracks appear in it so that white lines are visible intersecting the brown surface. Later the cracks become deeper the epidermis splits and several flaky curled up scales whitish inside and dark on the outer surface are seen the scales are often removed by friction and whitish roundish patches only remain. The eruption never develops in concentric rings like *tinea imbricata* the patches remain isolated or fuse together forming irregular larger patches. Some patches may disappear spontaneously after a time. The general health of the patient does not seem to be affected. In some patients there is a slight degree of eosinophilia.

Diagnosis — When the eruption is in the very first stage it might be mistaken for a form of pityriasis versicolor. In pityriasis versicolor however the epidermis does not split moreover in *tinea intersecta* the fungus is not found on the surface it grows between the superficial and deep layers of the epidermis. *Tinea imbricata* begins in a manner somewhat similar to *tinea intersecta* dark brownish patches being present and the fungus in both eruptions growing between the superficial and deep layers of the epidermis. In contrast to *tinea imbricata* however the eruption of *tinea intersecta* never develops in concentric rings is far less severe as patches may heal spontaneously and it is cured without much difficulty.

Treatment — Tincture of iodine and the usual antiseptic ointments such as chrisarobin (2 to 5 per cent) answer well.

TINEA ALBIGENA

(«KHL»)

This mycosis was described by Nieuwenhuis in Java. It is fairly common in the Malay Archipelago and is occasionally met with in Ceylon where I carried out some researches on it. It may be considered a variety of «Hong Kong foot» or *Tinea pedis* of the hyperkeratotic type.

Etiology — The affection is due to a fungus which Nieuwehuis believed to be a trichophyton (*T. albicans*). According to Langeron and other authorities it is in reality an *Aleurisma*. The growth on Sabouraud's media is very slow the colonies are whitish and show a powdery surface.

Symptomatology — The eruption generally affects the palms of the hands and the soles of the feet. It begins with the appearance



Tinea albigena (Ceylon case)

of small pruriginous spots on the palms and soles the epidermis becomes raised and bullae develop containing at first clear serum the bullae break and the skin remains dry and peels off the parts remain tender and there is a desquamation and pruritus. A process of diffuse keratosis develops the palms and soles becoming double their usual thickness deep fissures may be formed at the natural folds. Several horny semi-detached discs can often be seen at the dilated orifices of the sweat glands. The affection is very chronic it may begin in youth or in adult life. After some time a process of depigmentation of the skin sets in white patches leukodermalike developing and extending often to the legs and arms.

Treatment — Tincture of iodine and chysarobin ointment (1 to 5 per cent) answer fairly well but the apigmented patches are not cured

TRICHOMYCOSIS AXILLARES FLAVA RUBRA AND NIGRA

Remarks — Trichomycosis axillaris has been imperfectly known for years under the term lepothrix but the various clinical types were not differentiated and nothing definite was known of the aetiology the disease being ascribed to the most diverse germs In 1910 1911 while in Ceylon I studied the condition and separated three principal varieties of the disease the yellow variety the black variety and the red variety

Synonyms — Lepothrix (pro parte) trichomycosis palmellina (pro parte) trichonocardiasis axillaris trichomycosis nodosa trichomycosis chromatica chromotrichomycosis Castellani's trichomycosis

History — Paxton in 1869 described a nodular condition of the hair of the axillary regions which was later named lepothrix by Wilson Paxton's work was confirmed by Patterson and Pick who called the condition trichomycosis palmellina Payne Sonnenberg Babes and Barthelemey carried out investigations on the aetiology of the condition and described various bacteria including *Bacillus prodigiosus* (*Serratia marcescens*) as causative agents Eisner considered it to be caused by a diplococcus In 1910 to 1911 I described three varieties of the condition the yellow variety due to a fungus which I called *Actinomyces* (*Nocardia*) *tenuis* (*Discomyces Streptothrix Conistrep tothix tenuis*) the black variety due to the same fungus plus a black pigment producing coccus which I called *Micrococcus nigrescens* and the red variety due to the same fungus plus a red pigment producing coccus to which later Chalmers and O Farrell gave the name *M. castellani* These two authors called the condition trichonocardiasis Macfie thoroughly investigated the condition in West Africa and described a subvariety which he called trichomycosis fusca

Geographic Distribution — The yellow variety is common in all climates. The red variety is encountered much more frequently in the tropical than in temperate climates. The black variety is extremely rare in the temperate zone and may be said to be found only in the tropics.

Etiology and Pathology — My researches have shown that in the yellow variety a minute fungus is constantly present in enormous numbers (*Actinomyces tenuis* Castellani, 1911, synonyms *Streptothrix*, *Discomyces*, *Cohnistreptothrix tenuis* Castellani). In the black variety a black pigment producing coccus is found, *Micrococcus nigrescens* Castellani, 1911, living in symbiosis with it. In the red variety a red pigment coccus first observed and grown by me is present living in symbiosis with the actinomyces. This coccus later was called *Micrococcus (Rhodococcus) castellanii* by Chalmers and O'Farrell, who made a thorough investigation of the disease in the Sudan in 1913.

Microscopical examination of the affected hair with low power shows that the shaft is covered at several places by roundish formations which partially or totally encircle it. Under a high power a cleared specimen being used these formations will be seen to consist in the yellow variety of enormous numbers of the bacillary like hyphae of *Actinomyces (Nocardia) tenuis* embedded in an amorphous cementing substance. In the red and black varieties in addition to the masses of bacillary like bodies which are the mycelial segments of *A. tenuis* large groups of coccus like bodies are observed. *M. nigrescens* in the black variety and *M. castellanii* in the red variety.

Actinomyces tenuis Castellani, 1912

Synonyms — *Discomyces tenuis*, *Streptothrix tenuis*, *Cohnistreptothrix tenuis* Castellani, 1912.

The microscopical examination of the nodule in cleared specimens reveals the presence of enormous numbers of rod like bodies — the bacilliform hyphae of an *Actinomyces (Nocardia)* — which are Gram positive but not acid fast. If the nodules are kept in alcohol or formaldehyde for several months the fungus partially loses its property of being stainable by Gram method. The bacillary bodies vary in length from 2 to 3 microns and more, the average breadth is approximately from 0.1 to 0.3 microns; they may be straight or slightly bent, and seldom,

Treatment — Tincture of iodine and chysarobin ointment (1 to 5 per cent) answer fairly well but the apigmented patches are not cured

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if ever branching they are packed fairly close together and are embedded in a cementing substance apparently secreted by the fungus. This ground substance is fixed to the cortex of the hair and a portion of it lies under the cuticle and some of the superficial layers of the cortex. In regard to cultivation Chalmers and O Farrell observed some slight growth in hanging drops of equal parts of human serum and physiologic sodium chloride solution. The fungus grew showing branching forms and coccal forms. The branching was monopodial and the hyphae were non-septate. Macfie in one case succeeded in cultivating the fungus on ascitic sugar agar the colonies being small and translucent. Porcelli also cultivated it.

Micrococcus (Nigrococcus) nigrescens Castellani 1911

Micrococcus nigrescens is a Gram positive rather large non-motile coccus which in certain media may take the appearance of a cocco-bacillus. It produces a black pigment. Sugar mediums are more suitable for the growth of the organism than the ordinary agar.

Sabouraud Maltose Agar — Colonies appear from twenty-four to forty-eight hours after inoculation. They are roundish and at first white but after a couple of days the centre of each colony turns black and the pigmentation slowly spreads eccentrically. After a time the colonies may coalesce into a jet black mass.

Dextrose Agar — Growth similar to Sabouraud but slightly less abundant. The black pigmentation develops from the centre of the colonies and slowly spreads towards the periphery.

Leuculose Agar — Identical to dextrose.

Saccharine Agar — The pigmentation is less pronounced and does not spread to the whole of the growth.

Raffinose Agar — Same as saccharine.

Lactose Agar — Scanty pigmentation.

Alkaline Maltose Agar — Black pigmentation well marked though in many cases it does not extend to the whole growth.

Acid Maltose Agar — Growth less abundant than on alkaline maltose. Black pigmentation well marked.

Mannitol Agar — As alkaline maltose.

Inulin — As alkaline maltose but pigmentation less pronounced.

Saccharose — As inulin agar.

Glycerine Agar — Abundant growth the whole of which after a time becomes jet black.

Galactose — As inulin.

Adonitol — As acid maltose.

Ordinary Agar — Growth much less abundant than on most sugar agars, and black pigmentation less marked.

Serum — Growth fairly abundant but there is only a trace of pigmentation. The medium is not liquefied.

Gelatine — No liquefaction. The growth on the surface shows after a time some dark pigmentation but the growth along the stab is white.

Milk — No change

Woth. — General turbidity. A thin pellicle is often present. Microscopical examination shows cocci arranged in pairs or irregularly. They do not appear to be capsulated.

Peptone Water — Some growth at the bottom while the rest of the tube is clear.

Sugar Woth. — No formation of acid or gas.

Indol — Most strains produce a trace of indol.

Micrococcus (Rhodococcus) castellanii Chalmers and O'Farrell 1913

I isolated this coccus in 1910 in Ceylon from the red variety and later it was further investigated in the Sudan and named by Chalmers and O'Farrell *Micrococcus castellanii*. It is more difficult to isolate and to grow than the coccus observed in the black type of the disease. It is interesting to note that as a rule this organism grows better and shows more pigment on ordinary agar than on sugar mediums. The coccus is round or oval measuring from about 0.3 to 0.7 microns in diameter. It is separated medially by a clear central line into two half-moon shaped segments, this producing a diplococcal appearance. It is colourless and non-motile but excrete an amorphous non-gelular lemon-chrome pigment. In old cultures another pigment of dark brownish red appears (according to Ridgway's standards this colour is madder brown) but its relationship to the earlier pigment can easily be proved as demonstrated by Chalmers and O'Farrell by removing and suspending some of it in a sufficiency of distilled water when the fluid at once resembles a similar suspension of the yellow pigment. When however this is done in a small quantity of water a faint reddish tinge can be observed. The best medium for showing the striking yellow pigment is the potato on which in twenty-four hours the growth assumes this colour. The red pigment shows best in the ordinary agar slopes which when old exhibit the dark red pigment in the centre and the yellow pigment at the sides. The organism is easily stained by all the ordinary staining reagents and is Gram positive. However even in preparations showing most of the cocci well coloured by Gram's method a few cocci may be seen discoloured. The organism does not appear to have a capsule.

The coccus grows aerobically and also anaerobically. The optimum temperature appears to be 37°C. It also grows at 20°C on agar slopes but not as abundantly as at 37°C and the pigmentation is much less marked. The rate of growth depends somewhat on the medium; it grows quickest on potato and next best on ordinary or glycerine agar. On solid medium there is a yellow growth at first but on most mediums, if kept long enough, some red colouration will subsequently be found. The best medium for the red colouration as already stated, appears to be the agar slope. With regard to the other agar mediums the coccus grows well on dextrose and maltose agar. Like *M. Niger* etc. it produces neither acid nor gas in dextrose, levulose, galactose, arabinose, sucrose, raffinose.

dextrine inuline amygdaline erythrite adonite dulcitate isodulcitate mannite sorbitol or inositol It grows slowly on blood serum which it does not liquefy and well in broth and peptone water in which it forms a general turbidity gelatine is not liquefied It does not produce indol

In agar stabs the growth is confined to the line of puncture and to the formation of a yellow knob on the surface

Classification of Micrococcus Castellani — Chalmers and O Farrel have thoroughly investigated this point

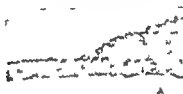
The organism belongs to the family Coccaceae (Zopf emended Migula) and must be grouped with the genus *Micrococcus* (Hallier 1866 emended Cohn 1872) In this genus it certainly belongs to those forms which grow well on agar mediums and are Gram positive and in this division it belongs to the subdivision which produces colours

The cocci of this subdivision which possess red colouration are only three in number — *M roseus* (Baum 1885) *M ruber* (Trommsdorff 1904) and *M rubidus* (Hefferan) Under the term *M roseus* (Baum emended Lehmann and Neumann) are gathered a large number of rose coloured diplococci which are not known to be parasitic and which produce growths on potato which are limited to the streaks These growths are faint rose colour with an oily lustre and are often surrounded by a whitish glistening zone thus giving rise to a very different appearance from that produced by *M Castellani* *M ruber* (Trommsdorff 1904) or as it is sometimes named *M chromidogenes ruber* is characterized by the fact that it does not grow on potato its colouring matter is not soluble in water and when treated by sulphuric acid the red matter turns blue green while *M Castellani* does grow on potato and its colouring matter is unaffected by 25 per cent sulphuric acid *M ruber* appears to be closely related to *M roseus* var *carneus* and to be non parasitic

Pathology — From my own observations and those of Chalmers and O Farrel it would appear that when the actinomyces fungus first attacks the hair it grows and pushes its way under a cuticular scale and then works its way into the cortex raising in so doing its superficial fibers which together with the cuticular scale form a covering or protection for the fungus which probably finds its nutriment in the cortex The fungus does not penetrate deeply into the cortex but grows outward forming the characteristic nodules This method of growth explains why the hair is so little affected the deeper layers of the cortex the medulla and the root of the hair are not involved though the hair at times loses its lustre In an early stage of the infection the cuticle and some fibres of the cortex may be seen to be raised in ridges which run in wavy lines across the shaft of the hair transversely to its long axis masses of the fungus

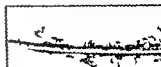
LITTLE KNOWN TROPICAL AND

may be seen growing under these ridges
of the rod like hyphae of actinomyces

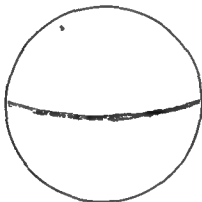


The three varieties of trichomycosis

genous ground substance. In the
actinomyces masses are surrounded



Symptomatology — *Trichomycosis flava* The affected hairs of the axilla and pubes present nodular formations of a yellow and occasionally yellow greyish colour plainly visible to the naked eye of rather soft consistency in the tropics and capable of being removed easily by scraping with a triangular needle or any similar instrument. The nodules are much harder and generally of much smaller size in temperate zones so much so that I at one time considered that there were two distinct clinical varieties of *Trichomycosis flava* the tropical variety characterized by the nodules being large soft and easily removed and the European variety or *lepothrix sensu stricto* characterized



Trichomycosis nigra

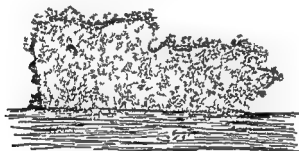
by the nodules being hard small and difficult to remove. Microscopic examination of the cleared specimens shows the formations to consist solely of enormous numbers of bacillary like bodies — the rod like hyphae of *Actinomyces (Nocardia) tenuis* embedded into an amorphous cementing substance. *Trichomycosis flava* affects the hairs of the axillary regions and more rarely those of the pubes. The affected hairs may occasionally become lusterless and somewhat depigmented.

Trichomycosis nigra The nodules are generally of the same size and consistency as those in *trichomycosis flava* but are black. Microscopic examination shows masses of rod like elements (*Actinomyces tenuis*) and masses of black pigment producing cocci *M. nigrescens*.

T. nigra appears to affect only the axillary hairs as I have never encountered *Trichomycosis nigra* of the pubic hairs

Trichomycosis rubra The nodules are red but the red pigmentation is of varied intensity and Macfie has described a subvariety of less vivid colour than usual which he has called *Trichomycosis fusca*. Microscopic examination shows the nodules to consist of large masses of actinomyces elements (*Actinomyces tenuis*) surrounded by masses of a coccus (*Micrococcus castellani*). *Trichomycosis rubra* may affect both the axillary and the pubic hairs

Mixed types — It is not at all rare in the tropics to find patients affected with two varieties of *trichomycosis* the hairs of one armpit



Nodule of *trichomycosis nigra*. Note bacillus like hyphae of *Actinomyces tenuis* and black masses of *Micrococcus (Micrococcus) nigrescens*

may show the yellow variety while the hairs of the other armpit may present the black type or the red type. At times the same individual hair may present some yellow and black or red nodules. I have not yet observed all three varieties present at the same time on the same patient.

Methods of infection — The usual method of infection appears to be from man to man. This is strongly supported by the following observation made by Chalmers and O'Farrell in the Sudan.

This observation tends to show that the incubation period is about two weeks, this being the length of time necessary before the infection produces sufficient growth on the hairs to attract attention.

A young European known to be quite unaffected with trichomycosis became greatly interested in the work carried out on the condition at Khartoum. He examined cases which came to the laboratory and handled and examined fresh hairs removed from the axillae. When he visited the laboratory he was clad in tennis attire and as he moved about his shirt rucked up from below repeatedly and whenever this occurred he adjusted it by pulling forward his leather belt with one hand while he pushed the soft shirt downwards inside his trousers with the other. Two weeks after examining cases he first noticed a reddish appearance on the hairs of the pubes. On examination it was found that the hairs were infected with the red variety of trichomycosis — that is to say with the variety which he saw and handled in abundance. It grew rapidly on the pubic hairs but did not extend to the axillae.

Complications — In acute cases in which the infection is heavy an erythematous condition of the axillae may be observed. *Hypendrosis* is common but so far I have come across only one case of *chromidrosis* associated with trichomycosis. In certain cases I have noticed a yellowish discolouration of the skin of the axilla and in one more completely investigated case an actinomyces fungus similar or identical with *Actinomyces (Nocardia) tenuis* was found in the patches.

Diagnosis — The diagnosis is easy being based on the presence of yellow nodules (*trichomycosis flava*) red nodules (*trichomycosis rubra*) and black nodules (*trichomycosis nigra*) on the hairs of the axillae and pubes.

Differential Diagnosis — The various types of trichomycosis have to be differentiated from Cheadle and Morris' tinea nodosa (known also as Beigel's trichosporis), Behrend's nodular trichosporis (Behrend's trichosporosis), Piedra Unna's piedra nostras (Unna's trichosporosis) and finally Du Bois' trichosporosis. The differentiation is easy as in none of the above conditions are fungi found of the actinomyces type viz. bacillus like and not thicker than one micron.

Prognosis — None of the varieties of trichomycosis axillaris has a tendency to spontaneous cure while the patients reside in a hot tropical country. In a patient going to a cold climate the condition may subside or even disappear completely. *Trichomycosis nigra* seems to disappear in a cold climate much more rapidly than *trichomycosis flava* or *trichomycosis rubra*.

Trichomycosis axillaris is a disease of not much importance but before the habit of shaving the axillae became general European women in the tropics at times were greatly distressed by it as when they wore low necked dresses the disfiguring red or black patches in the axillary regions were visible. It is a curious fact also that when natives are affected with trichomycosis they seem to regard it with disgust and readily seek treatment. Chalmers and O'Farrell have brought forward the hypothesis that the general custom of shaving the axillary hair among certain native tribes may have originated in their profound dislike of this complaint.

Treatment — The treatment originally used by me in Ceylon is generally efficacious. The affected hairs are dabbed twice daily with an alcoholic or aqueous solution of formaldehyde ($\frac{1}{2}$ 2%) at night a 2 to 5 per cent sulphur ointment is rubbed in. To allay the irritation of the skin caused by this treatment calamine lotion may be applied. Resorcin and salicylic alcohol solutions have also been used but as a rule they are not so efficacious. Tincture of iodine alone is practically without effect but it is useful in obstinate cases after a few days of the formaldehyde sulphur treatment. Chrysarobin ointment is messy and does not induce any striking improvement. The application of ether chloroform or creosote occasionally causes an improvement but the skin is often irritated. Dabbing the parts with a strong solution of lysol (10-20%) is at times efficacious. An alcoholic solution of B Naphthol (1-2%) is also frequently successful especially if combined with B naphthol ointment (3%). This treatment however may at times cause a rather severe irritation.

ACLADIOSIS

This disease was described by me in 1906 (British Medical Journal Oct 7). Cases have been observed in Ceylon the Federated Malay States and Macedonia. It has also been reported from Siam by Mendelson and from Brazil by O'da Fonseca and A. E. da Araujo (1927). A case was observed by me in Somaliland in 1936 and one quite recently in a patient coming from Angola.

Etiology — The condition is caused by a fungus which I isolated in Ceylon. Cultures were sent to Professor Pinoy at the Pasteur Institute who made a complete investigation of it and called it *Acladium castellanii*.

The fungus grows well on ordinary laboratory media such as glucose agar potato carrot. The growth on glucose agar consists



Acladium typical ulcers

usually of many small roundish masses which later on coalesce covered by spiculated formations giving them a prickly appearance. These spicules on microscopical examination consist of straight erect filaments parallel to each other or at times interlacing. Each mycelial filament is about 2 microns in breadth and carries laterally conidia — using the term *sensu lato* — of variable shape usually pyriform or spherical attenuated in at their points of insertion. The dimensions of the conidia are on an average 4 microns in length and 3 microns

in breadth This type of fructification recalls the type of *Acladium* fructification described by Bodin in certain species of the genus *Trichophyton* (Malmsten) These conidia become detached and mycelial filaments develop from them At times chlamydospores are fairly frequently terminal the dimensions being variable — 8 to 10 microns Fructifications of the type *Aleurisma* (apical clusters) are also constantly present and for this reason Langeron has placed the fungus in this genus In recent years the fungus has been placed in several different genera by different authors Butler has placed it in the genus *Sporotrichum* (*Rhinocladium*) but according to Langeron this is a mistake as in the genus *Sporotrichum* (*Rhinocladium*) the spores are radulo spores and when they become detached so many short pedicels remain on the hypha while in the fungus found by me the spores are not radulo spores and are arranged as in the genus *Aleurisma* and genus *Acladium*

Histopathology — The three principal types of lesion may be distinguished

- 1) The polymorphonuclear or ecthematous type being an infiltration of the tissues consisting principally of polymorphonuclear leucocytes
- 2) The epithelioid or tuberculoid type in which there is a marked cellular infiltration consisting chiefly of round cells epithelioid cells and giant cells
- 3) The lympho connective tissue or syphiloid type characterized by a round cell and plasma cell infiltration with proliferation of the endothelial cells of the intima

Symptomatology — In a well marked case ulcerative lesions are present all over the body but less numerous or absent altogether on the face scalp palms of the hands and soles of the feet The ulcers are sharply defined roundish or oval with a fundus studded with rather prominent red granulations They secrete an abundant purulent fluid which dries up in thick yellow crusts in such a way that in some cases no ulcerative lesions are seen but only yellow crusty rupioid lesions which may be easily mistaken for yaws nodules In addition to the ulcerative lesions gumma like swellings may be

peared within two or three days. The intradermic injection of the other fungus produced much more evident and deeper lesions which ulcerated and later became covered with yellow crusts and did not disappear before two or three months. These lesions so produced had a close resemblance to those seen in the patient although a generalized eruption did not develop. We believe therefore that the *Asper*



Paracanthoma from a colored sketch

gillus had nothing to do with the aetiology of the malady while the other fungus is probably the aetiological agent of it.

Description of the Fungus — The fungus grows well on ordinary media and on glucose agar the growth often resembling that of *Asciadium* vel *Asciurisma castellanum* being yellowish or brownish and often showing spicules on the surface. After two weeks but sometimes much longer the microscopical examination often shows presence of

conidial fructifications identical or very similar to those seen in hanging drop cultures

Hanging Drop Cultures — In hanging drop cultures (peptone water or glucose broths 2 per cent) a large amount of mycelium is found the mycelial hyphae remaining isolated or at times collected in sheaves. The mycelium is septate ramified and there is often anastomosis between various hyphae. Each hypha varies in breadth between 2.5 and 3.8 microns. The protoplasm of the hypha is usually



Aleurisma orientale From a hanging drop culture

hyaline occasionally granular and may contain fatty droplets. Intercalary chlamydospores may be present. About the fifth or sixth day or later some mycelial hyphae become differentiated from the others; they are much thicker and the membrane may take a brownish colour; they are conidiophores. The fructifications appear as small bunches of pedunculated conidia (aleuroconidia) which are roundish hyaline sometimes of a greenish or brownish colour 3 to 4 microns in diameter. These fructifications are somewhat similar to those found in the genus *Aleurisma*.

Physiological Characters — The organism slowly liquefies gelatine and peptonises milk. In certain sugar media it may produce acidity.

but this does not appear to be constant it does not liquefy coagulated serum at least not within the first two weeks

Classification — Cultures were sent to the well known mycologist Professor Curzi who came to the conclusion that the fungus



Paraceladiosis trichophytic like patch

was an ascomycete and belonged to the genus *Ascrothrica chartarum* Berkely 1838 Langeron however has not confirmed Curzi's results and has placed the fungus in the genus *Aleurisma* The correct terminology would apparently be *Aleurisma orientale* (Castellani and Jacono 1934) Langeron 1938

Pathology — The principal type of lesion is granulomatous There is a cellular infiltration of the corium consisting of round cells

and epithelioid cells and some giant cells are present. Evidence of acanthosis may be noted in the epidermis.

Experimental pathology — The intracutaneous injection of the fungus into white mice, guinea pigs and rabbits does not produce any definite lesion. Peritoneal injection produces small nodules of a greyish white colour situated on the surface of the spleen, liver and in the omentum. The nodules consist of masses of the fungus and a large number of leucocytes. Intrapulmonary inoculation causes small abscesses and granulomatous lesions.

Symptomatology — In our case the eruption when seen by us had been present according to the patient for more than three years. The whole body but principally the lower and upper limbs presented large rupoid crusty lesions of a yellow colour 2 to 4 cm in diameter, several of them — the less recent ones — surrounded by a zone of hyperpigmentation. These lesions were very scanty on the scalp and absent on the face, palms of the hands and soles of the feet. The crusts were very thick; on removing them usually no true ulcerations were seen; the surface had more the appearance of what one sees in a case of psoriasis when the masses of scales have been removed, a slight punctiform bleeding surface without ulceration. At times however true ulcerative lesions were present but were always shallow, oval or roundish with a maximum diameter of 2 to 4 cm with rather well marked granulations but no special characteristic features.

A few furuncle like lesions were also present and a very few quumma like swellings.

From time to time here and there a few small papules the size of a pinhead, red and pruriginous appeared on healthy parts of the skin. These quickly became papulo-vesicles and later pustules coalescing into a crusty mass and a superficial ulcerative process at times developed.

The patient complained of intense pruritus. The lymphatic glands of the inguinal and axillary regions were somewhat enlarged and hard. A few lesions spontaneously disappeared leaving behind hyperpigmented patches.

Culture reaction — From cultures on glucose agar fifteen days old thick emulsions were made in saline. These emulsions after eight days were filtered through Berkenfeld N candles. With the filtrate cuti reactions were carried out in the patient in healthy areas of the skin they were also carried out in other individuals suffering from various diseases and in normal individuals. In the Chinese patient a very marked reaction took place a red infiltrated patch developed some hours after the inoculation. In all other individuals no reaction was noted or only a very slight one.

Prognosis — Apparently the disease has no tendency to spontaneous cure although a few lesions may disappear spontaneously leaving behind a hyperpigmentation.

Diagnosis — This is based on the presence of numerous very pruriginous lesions with thick yellow rupioid crusts in which the *Aleurisma orientale* is found.

The disease must be differentiated from syphilis, yaws, acrodermatitis and trichophytosis and favus. The disease differs from syphilis in the intense pruritus and in the blood being negative for Wassermann, from acrodermatitis in the absence of definite fairly deep round or oval ulcers with prominent granulations when the crusts have been removed from the ordinary types of ringworm by the absence of eruptions developing in rings and by the presence of thick yellow rupioid crusts from favus by the crusty lesions being rupioid and not cup like and by the fungus being totally different from favus fungi.

It is interesting to note that our patient had been diagnosed as a case of syphilis by well known specialists. The authorities of the Missionary School were naturally very upset at this diagnosis.

Treatment — Potassium iodide had not much effect. The treatment we found most efficacious was the application twice a day of the so called Castellani's Fuchsin/Paint the formula of which is as follows: Saturated alcoholic solution of basic fuchsin 10 cc. 5 per cent aqueous carbolic acid solution 100 cc. filter and add boric acid 1 gm. after 2 hours add 5 cc. of acetone and 2 hours later 10 gm. of resorcin.

It is advisable to discontinue the treatment from time to time when a soothing ointment may be applied for two or three days such as bismuth carb grm 0.30 vaseline or cold cream grm 30

TRICHOASPERGILLOSIS AND TRICHOPENICILLIOSIS

The affected hairs — generally of the beard and moustache occasionally of the axilla — present dirty greyish or whitish punctiform formations which on microscopical examination are seen to consist of penicillar or aspergillar fungi (*Penicillium barbae* *Aspergillus barbae*). Occasionally both types of fungi are found on the same patient. The affection is very chronic. The diagnosis is easy the characteristic aspergillus and penicillium fructifications distinguishing this condition from other parasitic nodular infections. The simplest method of treatment is by shaving and afterwards using regularly a medicated soap such as carbolic soap tar soap or sulphur soap.

If the patient does not wish to shave his beard turpentine may be tried.

In natives who do not bathe frequently such as old persons and beggars the skin presents often large dark patches due to accumulated dirt in which aspergillar or penicillar fungi are often present living saprophytically. This condition has nothing to do with a true mycosis as a thorough scrubbing with soap will remove the dirt and the aspergilla and penicilla fungi which may be present.

MYCOTIC PRURITUS ANI

Some years ago I described as a separate entity «Pruritus ani of mycotic origin». My publications which appeared mostly in the Journal of Trop. Med. & Hygiene during the years 1924-30 attracted little attention at the time but in recent years the importance of this type of pruritus ani has been recognised.

These are two chief aetiological varieties the variety due to *Trichophyton* fungi and the variety due to *Candida* vel *Monilia* fungi. Cases of mixed infection occur.

Cutireaction — From cultures on glucose agar fifteen days old thick emulsions were made in saline. These emulsions after eight days were filtered through Berkenfeld N candles. With the filtrate cuti reactions were carried out in the patient in healthy areas of the skin they were also carried out in other individuals suffering from various diseases and in normal individuals. In the Chinese patient a very marked reaction took place a red infiltrated patch developed some hours after the inoculation. In all other individuals no reaction was noted or only a very slight one.

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These are two chief aetiological varieties the variety due to *Trichophyton* fungi and the variety due to *Candida* vel *Monilia* fungi. Cases of mixed infection occur.

Clinical Symptoms — The patient complains of severe pruritus in the ano perianal region not as a rule continuously but at intervals. The pruritus is often worse at night but the attacks of unbearable itching may come at any time. Inspection of the anal perianal region in recent cases may reveal nothing at all except perhaps signs of scratching but in most cases on careful examination minute red slightly raised infiltrated patches may be seen in the perianal region occasionally arranged in two curved lines. In a number of old cases signs of an eczematous dermatitis due to scratching are present and



Mycotic pruritus and chronic eczematoid form

streptococcus and other secondary bacterial infections may become engrafted on the mycotic condition.

When the secondary bacterial infection becomes abundant especially if many coli and proteus germs are present the fungus may disappear completely or become extremely rare. In some old standing cases the skin is thickened and lichenified.

Etiology — *Trichophyton* like fungi. In a certain number of cases trichophyton like fungi are present although examination may have to be repeated very many times before getting a positive result.

Yeast like fungi — In a number of cases of pruritus ani I found fungi of the genus *Candida* and rarely other yeast like organisms.

(*Saccharomyces* *Debaromyces* *Torulopsis* etc) either alone or together with trichophyton like fungi

Mycetid — Occasionally no fungi are found and the condition seems to be of the nature of a mycetid due to some distant focus of fungal infection as for instance *tinea interdigitalis*

Bacteria — Bacteria are always present but as a rule they are econdary invaders and not the true causative agents of the pruritu

Diagnosis — A definite diagnosis of the trichophytic variety of mycotic pruritus ani cannot be made without trichophyton like fungi being found microscopically or by cultural methods a diagnosis of probability can be made however on clinical grounds the minute red infiltrated patches fairly often seen on careful examination in the ano perianal region being suggestive especially if the patient is suffering from mycotic dermatitis of the toes or gives a history of having suffered from dhobie itch or *tinea cruris* in the past When the bacterial flora is abundant it may be extremely difficult or impossible to isolate the fungi

A diagnosis of *Candida* (*Monilia*) pruritus ani (monial pruritus ani) should be made only when trichophyton like fungi on repeated examinations are absent while candidae are present in very large numbers Cases of mixed infection occur

Course and Prognosis — The course of the condition is chronic but periods of great improvement and apparent cure may alternate with periods of severe recrudescence Attention should be called to certain cases fortunately rare in which although the eruption under appropriate treatment has completely disappeared the pruritus continues This is observed in highly strung nervous persons Difficult cases are also encountered in patients suffering from or having tendency to true eczema when they become infected with epidermophyton or trichophyton like or monial fungi either the irritation caused by the fungi themselves or that set up by the treatment to eradicate the condition may precipitate an attack of eczema not only in the ano perianal region but also in many other regions of the body

Persistence of Pruritus after apparent Disappearance of the Fungal Infection — In previous publications I have called attention to the occurrence of cases fortunately rare in which after the antimycotic treatment all the objective symptoms of epidermophytosis or candidiasis disappear and the microscopical and cultural examinations are negative but the pruritus remains for many weeks and months. The pruritus may be of different origin

(a) The clinical signs have disappeared but the mycotic infection is still present although in such small amount that the cultural and microscopical examination may be negative or some distant mycotic focus (toes) may be present (mycetid) (b) overtreatment and mild acquired hypersensitivity to the various antimycotic ointments (c) nervous origin in some highly strung individuals the pruritus remains long after the infection has disappeared

Treatment — In my experience by far the simplest and most efficacious treatment is the application twice a day of Castellani's fuchsin paint both around and inside the anus. Should the patient refuse the treatment tar and salicylic ointments are useful. Deek's ointment gives good results. It consists of salicylic acid 4 parts bismuth subnitrate 10 parts mercury salicylate 4 parts oil of eucalyptus 4 parts petrolatum and wool fat sufficient to make up 100 parts. It is interesting to note that long ago Deek found that this antimycotic ointment had a beneficial action in many cases of pruritus ani although the existence of the mycotic type of the condition was not known at the time.

Another useful treatment is the following: during the day apply several times a lotion consisting of Resorcine grm 4 alcohol purum grm 20 Glycerine grm 2 Aqueae dest at grm 200. At night apply the following ointment: Ac salicyl grm 0.30 Be/Naftol grm 0.15 /
Ac carbolicum grm 0.30 Vasel grm 30

DERMATITIS INTERDIGITALIS PEDUM GEOTRICHICA
(GEOTRICHUM MANGO TOE TINEA PEDUM GEOTRICHICA)

Dermatitis interdigitalis pedum — known popularly by many names among which in the East «Mango Toe» — is usually of trichophytic or epidermophytic origin or of *Candida* (*Monilia*) origin. I have described a third variety that due to fungi of the genus *Geotrichum* (Journ of Trop Med & Hygiene March 15th 1940)



Tinea pedis geotrichica

Clinically it is not possible to differentiate this last variety from the other two and microscopical and cultural studies are necessary (vide infra). Cases of mixed infection geotrichosis and candidiasis (*monilia* is) occur.

The best treatment is by the application of the fuchsin paint twice daily for several days.

It may not be out of place to say a few words on fungi of the genus *Geotrichum* often placed in my opinion wrongly among the so-called yeast-like fungi the chief type of which is represented by the genus *Candida* (*Monilia*) sensu medico. Genus *Geotrichum* Link 1809 — In the lesions and culture the fungi of this genus appear under the form of large mycelial filaments and articles and squares or rectangular arthrospores without free budding cells (blastospores) being present.

Arthrospores as well known are produced by a close septation of a mycelial hypha a fragmentation of the hypha takes place and the arthrospores become free. Some of the freed arthrospores from a square shape may gradually take up a roundish shape and one of these roundish bodies may show at times a bud like protuberance prolonged microscopical examination will show that the bud like protuberance prolonged microscopical examination will show that the bud like bulge gradually gives rise to a filament not to another roundspore (blastospore)

Fungi of this genus produce no gas fermentation of sugars they may produce acidity

The chief species of the genus are the following

G. candidum Link 1809 (= *G. lactis* Fresenius 1850)

G. rugosum Castellani 1910 (= *C. rotundatum* Castellani 1911)

G. asteroides Castellani 1914

G. matalense Castellani 1915

Geotrichum candidum (= *G. lactis* = *Oidium lactis*) is commonly found in milk. The cultures on glucose agar are white or greyish.

G. rugosum Cast 1910 (= *Haemyspora rugosa* Cast 1912 = *Geotrichum rotundatum* Cast 1912) Found in faeces and in sputum and in skin lesions. Cultures on glucose agar amber colour or yellowish or brownish rugose or vermicular or cerebriform.

G. asteroides Cast 1914 — found in stools and sputum. Cultures on glucose agar typically asteroid.

G. matalense Cast 1915 — Found in stools and in sewage. Glucose agar cultures hairy fluffy white.

Complete descriptions of above fungi may be found in Castellani & Chalmers Manual of Tropical Medicine p 1093

Yeast like fungi. The practical clinical mycologist often uses the term «yeast like fungi» or «budding fungi» or «blastomycetoid fungi» or «fermentoid fungi» or «levuriform fungi» or even simply «yeasts» as a collective term to denote fungi which reproduce solely or principally by budding and appear in the lesions under the shape of roundish or oval cells some of them budding with complete absence or great scarcity of mycelium in cultures mycelium may be present although usually the free roundish or oval budding cells greatly predominate.

Simple classification of yeast like fungi

Yeast like or Budding Fungi — Mycelium	{ Present — Asci	Absent	<i>Torulopsis vel Cryptococcus sensu lato</i>
		Present	<i>Saccharomyces sensu lato</i>
	{ Absent — Asci	Absent	<i>Candida (Monilia) sensu lato</i>
		Present	<i>Endomyces sensu lato</i>

Fungi of the genus *Candida* may be defined in a practical way as yeast-like fungi or budding fungi — never presenting asci — which in the lesions and in

cultures appear in the form of roundish or oval budding cells (4-7 microns in diameter) with a very little amount of mycelium or more correctly pseudomycelium. The principal species of the genus are the following: *C. albicans* (with four principal varieties: *C. albicans* var. *candidans*, *C. albicans* var. *pinoyi*, *C. albicans* var. *metatondinensis* and *C. albicans* var. *stellatoidea*), *C. krusei*, *C. tropicalis*, *C. pseudotropicalis*, *C. guilliermondii*, *C. bronchialis*, *C. rho*, *C. macedoniensis*. In *Candida macedoniensis* according to some authors among whom H. A. Diddens and J. Lodder are present and by these authors it has been transferred from the genus *Candida* to *Saccharomyces*.

Serologically according to the work done on the subject some years ago by myself and Mackenzie Douglas it would appear that several serological groups may be distinguished. The first group contains *Candida albicans* and its varieties and also *C. tropicalis*; the second group contains *C. pseudotropicalis*; the third group contains *Candida macedoniensis* and its varieties; and the fourth group contains *C. krusei*. For the differentiation and classification of the species of the genus *Candida* many other laboratory methods have been employed among which the carbohydrate utilization test, Castellani's absorption test, the precipitin test, the precipitin absorption test.

DERMATITIS GLUTEALIS FISTULOSA
(BLASTOMYCOSIS GLUTEALIS OF KARTULIS)

This condition was described by Kartulis at the end of the last century in Egypt. I have seen several cases in Ceylon and the disease has been thoroughly investigated by Gohar in recent years in Egypt.



Blastomycosis glutealis (Ceylon case)

The gluteal regions one or both present a diffuse induration and the surface is cribrated with the openings of sinuses from which a thin pus exudes containing no grains. The sinuses may be very deep and communicate with each other but generally do not communicate with the intestine.

The fungi found are usually of the *Candida* (*Monilia*) type but occasionally no fungi of any kind are found only many diverse bacteria. Maxwell in China has described a clinically similar condition which he thinks to be of amoebic origin (Jeffrey & Maxwell's Diseases of China 1929).

The treatment is most unsatisfactory but a combined treatment consisting of potassium iodide sulpha drugs and penicillin and other antibiotics may be tried

PARAMYCETOMA

This term has been used by Chalmers Archibald and myself to indicate a condition of the foot clinically undistinguishable from *madura foot* but for the fact that there are no grains The microscopical examination will often reveal presence of scanty thin mycelial



Pseudomycetoma of framboetic origin (Ceylon case)

filaments In my experience most of these cases are in reality cases of *agranular actinomycosis* and are due to various *Nocardia* fungi (aerobic *Actinomyces* fungi) For more details the reader is referred to Castellani & Chalmers Manual of Tropical Medicine 1919 pag 2145

PSEUDOMYCETOMA

This is a term introduced by myself (Castellani & Chalmers Manual of Tropical Medicine 1919 pag 2147) to indicate a condition of the foot clinically closely resembling *mycetoma* but in which no fungi and no grains are found It is known to the natives of New Guinea as *Roacki Buno* or *Auma*

It may be of various causation. In the tropics it is usually of yaws origin, being a late manifestation of the disease without other symptoms. The foot is enlarged, deformed and swollen, and sinuses, ulceration and discharge may be present. In the temperate zone I have seen a case of tubercular origin.

LUETIC PSEUDO CYSTICERCOSIS

This rare condition was described by me in 1937 (*Journal of Tropical Medicine & Hygiene* October 1st 1937) and further investigated with Acanfora in 1938 (same *Journal* July 1st 1938).

The patient gives a history of having noticed on palpation a number of small nodules under the skin in the arms and legs, usually while drying himself after bathing. His general condition of health may be good or he may complain of feeling tired and nervy, and there may be slight fever at night. He generally gets very worried over the presence of these nodules, although they are not visible but only palpable and will seek medical advice. The practitioner will find on palpation numerous small nodules, usually the size and shape of rice grains, which give the impression of being embedded in the subcutaneous tissue. They may be hard but not rarely have a slightly elastic feeling. A few may be roundish. They are not tender or only slightly so. The skin is normal. There is no pruritus. The blood shows no eosinophilia. The urine is normal.

Of the three cases observed by me, two had been diagnosed as cysticercosis, and the third was diagnosed as possible cysticercosis and later as trichinosis in calcification stage, but the X-ray examination showed nothing abnormal. In none of them was there history of syphilis, but the blood gave a strong Wassermann reaction in all. The superficial lymphatic glands were not distinctly enlarged. No rashes or history of rashes.

ILLUSTRATIVE CASE

N. B., aged 24, Italian road labourer, H. was shown to me, 1935, at a hospital in Italian East Africa, as an obscure case that might be cysticercosis. His general condition of health was fairly good, although some slight temperature was present at night, 37.2 C to 38 C. He was very worried over the presence of

numerous nodules on the arms and legs — palpable not visible — which he had discovered some months previously when rubbing himself after bathing. The examination of the chest and abdomen revealed nothing abnormal. Spleen and liver not palpable. Superficial lymphatic glands not enlarged. In the arms and legs numerous small nodules, most of them rather hard, the size and shape of grains of rice, some with a sort of elastic feeling, could be palpated. They felt very much like the nodules found in partially calcified cysticercosis. Urine normal, stools normal. The blood showed some slight anemia of the hypochromic type but no malaria parasites, no eosinophilia. Wassermann test strongly positive (++++). He denied ever having had syphilis. No scars on the penis. No antiluetic treatment was given.

A year later this patient was admitted to a hospital in Italy and a definite diagnosis of trichinosis was made. Later he was admitted to the University Clinic of Tropical Diseases in Rome and a thorough investigation of the case was carried out under my supervision. The appearance of the patient was exactly the same as when I saw him in Africa, his general condition of health being fairly satisfactory but he was extremely nervous and worried over the presence of the nodules which were not visible — they could only be found by palpation. A slight temperature was present occasionally in the evening but not so regular and persistent as in Africa. X-ray examination revealed nothing. In the blood no eosinophilia was noted. Wassermann test repeated three times, as always strongly positive (++++). A biopsy was carried out and the nodule was excised. No sign of cysticercosis or trichinosis, calcified or otherwise. The nodules consisted of fibrous tissue.

The patient was placed on an antiluetic treatment consisting of neoarsphenamin and bismuth injections. All the nodules disappeared within three weeks and the patient looked and felt quite well.

Pathology — The nodules, although often giving the impression of being free in the subcutaneous tissue, develop usually on and in the fasciae of the muscular masses of the limbs. Microscopical examination shows that they consist of fibrous tissue. Silver staining did not reveal any spirochaetes in my cases.

Diagnosis — This is based on finding on palpation numerous small subcutaneous nodules, usually the shape and size of rice grains, while the Wassermann test is positive and a specific antiluetic treatment cures the condition. A biopsy will show no signs of cysticercosis or trichinosis.

Prognosis — Excellent if the correct diagnosis is made.

Treatment — Penicillin, arsphenamin or neoarsphenamin and bismuth should be given as in the usual forms of lues.

ELEPHANTIASIS NOSTRAS

(BACTERIAL ELEPHANTIASIS NON FILARIAL ELEPHANTIASIS)

Non filarial elephantiasis is not a tropical disease so much so that another name for it is elephantiasis nostras but as it occurs also in the tropics and as very little is found about it in books it may not be out of place to discuss it here

The term elephantiasis is used in practice to denote any enlargement and deformation of a limb or other part of the body the consequence of the blocking of the lymphatics. Many causes may induce the condition and therefore aetiologically there is not one elephantiasis there are several elephantiasises

The following is a simple classification of the elephantiasises

1 — Elephantiasis tropicalis (Elephantiasis filarica) believed to be due to *Filaria bancrofti* (*Wuchereria bancrofti*) and *F. malayi* (*W. malayi*)

2 — Elephantiasis nostras (Elephantiasis non filarica Elephantiasis bacterica) due to bacteria

3 — Elephantiasis symptomatica vel pseudoelephantiasis caused by various conditions of syphilitic, framboetic, tuberculous, poro-adenitic, neoplastic, post operative (removal of lymphatic gland) and other origin

4 — Elephantiasis congenita vel Morbus Meigen Milroy congenital

I will limit myself to discussing only Elephantiasis nostras

Elephantiasis nostras. Symptomatology — The disease begins with an attack of lymphangitis usually of the leg with high fever and the patient may feel very ill there may be great prostration. On the affected limb red erysipelas like patches are seen. The condition may extend up or down the limb. In some cases the redness is linear or in streaks. The affected limb becomes oedematous and there may be pain and tenderness. The inguinal glands are generally enlarged and painful. Although after the first attack of lymphangitis the swelling may disappear and the limb may resume its normal size this does not happen after repeated successive attacks and gradually

the limb becomes more and more swollen while the natural fold, especially the ankle fold becomes more exaggerated by the swelling on either side so that deep sulci are formed. The dorsum of the foot



Case of insipient *Elephantiasis nostras*. Appearance of leg after an erysipelatous like attack of fever. These attacks recurred every two or three months.

becomes swollen and puffy and is separated by the deep ankle sulcus from the swollen lower part of the leg.

At first the skin is smooth and soft forming the smooth variety of the complaint — *elephantiasis nostras glabra* — which may in some cases persist indefinitely or the skin may later become hard thick

and rough being elevated into bosses or warty elevations often of a dark colour forming the verrucose variety — *elephantiasis nostras verrucosa*. The appendages now atrophy from malnutrition the hairs may drop off and the nails become rough and thickened while the



Case of Elephantiasis nostras

The patient was born in Great Britain and never left the country

skin perspires less and the sensibility may be diminished. The swelling is more commonly met with below the knee but the whole thigh may become implicated.

If left untreated the size of the leg gradually increases with repeated attacks of fever and may reach enormous dimensions. After some years the attacks of fever may cease altogether although the condition of the leg usually remains unchanged.

Regions of the body affected — These seem to be the same as in filarial elephantiasis the most common situation being the lower limbs The scrotum is affected fairly frequently the upper limbs very seldom the face and lips occasionally When the disease affects the scrotum it begins usually with recurring erysipelatous attacks with ■ red inflammatory blush on the skin and fever After each attack the scrotum is larger than before and it goes on increasing until it reaches an enormous size It may be studded with numerous soft lymphatic vesicle like nodules If one of these is pricked quite a large amount of lymph may exude The penis itself is buried in the tumour The testicles are situated in the upper portion and back of the tumour and may be surrounded by hydroceles

Blood — There is often a slight degree of anemia often of the hypochromic type During the febrile attacks leucocytosis may be noted but there is no eosinophilia In the cases investigated chemically no abnormality was found

Urine — Nothing abnormal During the pyrexial attacks slight albuminuria may be present

X rays — As a rule no abnormality is found in the bones and no enlargement

Course — This is chronic and progressive and there is no tendency to spontaneous cure

Diagnosis — It is impossible to differentiate clinically between elephantiasis nostras and filarial elephantiasis as in both conditions there are repeated attacks of lymphangitis followed by temporary oedema then solid oedema and finally pachydermia with great hypertrophy of the skin and subcutaneous tissue

In elephantiasis nostras the blood never shows presence of microfilariae but this also occurs in many cases of filarial elephantiasis In elephantiasis nostras there is no eosinophilia but eosinophilia ■ far from being a constant feature in filarial lymphangitis and is absent in a number of cases of filarial elephantiasis



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In practice the diagnosis of elephantiasis nostras is based chiefly on the knowledge that the patient contracted the disease in a country



Case of Elephantiasis nostras The patient was born in Great Britain and never left the country. The left leg began to swell many years ago after an effort he made in lifting a piano which was followed by enlargement of the inguinal glands and fever. Since then from time to time he had attacks of fever with red patches on the leg and thigh. The swelling attained large dimensions. He was treated in several different hospitals and various operations were performed on him without any lasting benefit. From this case *Micrococcus metamyceticus* was isolated from the inguinal gland juice during an attack of lymphangitis (1930). All laboratory investigations for filarial infection were negative.

where filaria is absent and also on the negative results of the serological and skin tests for filariae.

Etiology — Many authorities believe elephantiasis nostras to be due to the ordinary Gram positive streptococci entering the lymphatics and the general circulation through small wounds or minute losses of substance such as the cracks between the toes in *Tinea pedis*. It is probably true in some cases but in others the aetiological agent seems to be a much more delicate organism.

During the last two decades I have investigated bacteriologically eighteen cases and in seven I have grown from the inguinal glands and unbroken soft lymphatic skin nodules a Gram negative coccus or coccobacillus to which I gave the specific name *Metamyceticus*.

Micrococcus (Coccobacillus) metamyceticus Cast 1933 (Journal of Tropical Medicine & Hygiene) September 1933 and September 1934) — This organism has been isolated by me from the inguinal glands of cases of elephantiasis nostras chiefly in England and Italy during the pyrexial attacks. None of the patients had been in the tropics and all laboratory examinations for flares were negative. For some time I considered the organism to be a strain or variety of *Micrococcus mycetis*. The first description of it as a separate species was given in 1933 and a more complete description was given in the following year (Journal of Tropical Medicine & Hygiene September 1934). In the latter paper not only the aetiology but also the pathology, clinical aspects and therapeutics of the disease are discussed.

Morphological and Staining Characters — When first isolated this organism morphologically is a Gram negative coccus and the coccal cells are arranged in twos or in irregular groups or in short chains but after subculturing especially if trypticized agars used preparations frequently show in addition to the coccal form coccobacillary and bacillary forms. Also Gram negative in fact, when the organism has been transplanted very many times on trypticized agar the bacillary forms may be quite abundant although the cultures are absolutely pure. The organism seems to be pleomorphic and might be considered to be a *Coccobacillus*. The term *Coccobacillus* is not accepted in scientific literature as a term denoting a definite genus but it is useful in practice as a sort of colloquial general term to indicate organisms which may appear both as coccus and rod like organisms. With regard to Gram staining it must be noted that very old strains may at times become temporarily Gram positive.

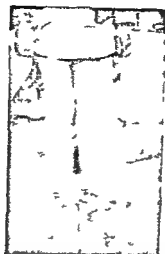
Agar — The organism grows very scantily or not at all on ordinary Italian plain agar or so-called poor agar (agar prepared with peptone water instead of broth) but grows fairly well on trypticized agar.

Glucose Agar — Growth scanty. Some strains do not grow on this medium.

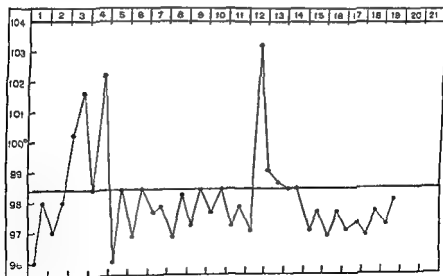
Coagulated Serum — The organism usually grows fairly well on this medium the colonies are small, delicate and may coalesce no liquefaction takes place.

Blood Agar — Growth good. Often haemolysis is noted.

Gelatine — No liquefaction.



Elephantiasis nostras Portuguese case Maria L. Born in Portugal near Cascais never left the country. The disease started over 20 years ago with attacks of fever and erysipelatous patches on the left leg. All laboratory investigations for malarial infection were negative.



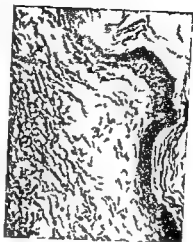
Temperature chart of a case of Elephantiasis nostras (Italian case) during attacks of lymphangitis



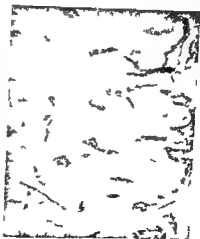
Micrococcus metamyceticus Stained preparation from serum culture 12 hours old. Note presence of coccobacillary and bacillary forms $\times 750$



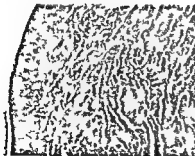
Elephantiasis nostras. Section of smooth skin $\times 240$ Staining by Weigert's iron haematoxylin and Van Gieson. Note flattening of the epidermis with heaped up angular processes. Nuclei of the hyaline layer close together, no prickles or intercellular bridges. Note hyaline layer below germinal layer.



Elephantiasis nostras Weigertii iron haematoxy and Van
 Osess. High power view of corium of digital process Shows
 myxomatous nature of corium



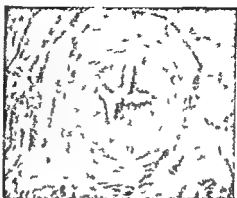
Elephantiasis nostras Italian case Section of skin Low
 power Note enormous fibrosis and perivascular foci of
 cellular infiltration



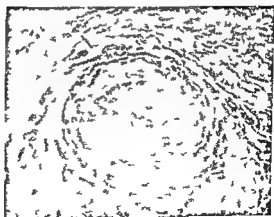
Elephantiasis nostras glabra. Section of skin from a case of elephantiasis nostras glabra. Magnification $\times 56$. Stained by Weigert's iron haematoxylin and Van Gieson. Stratum corneum acally. Stratum spinosum shows scantiness of cytoplasm with nuclei set close together. Connective tissue consists of intersecting bundles of connective tissue separated by lymph channels. No small cell infiltration is noted. No flattening out of the interpapillary processes.



Elephantiasis nostras glabra. Section of skin from a case of Elephantiasis nostras glabra. Magnification $\times 14$. Stained by Weigert's iron haematoxylin and Van Gieson. Note finger-like processes with hyperkeratosis and Malpighian layer much thinned.



Elephantiasis nostris Section of deep portion of true skin
Magnification $\times 240$ Staining by Weigert's haematoxylin and
Van Gieson Ateroma of arteriole The intima is especially
thickened and the lumen of the vessel is stellate



Elephantiasis nostris Thrombosed vessel

Ltms Milk — The reaction is not changed or a very slight acidity may be present no clotting takes place

Biochemical Reactions — The organism ordinarily produces acidity never gas in glucose levulose mannitol aulin arabinose salicin raffinose dextrin xylose arbutin The biochemical reactions may vary slightly in different strains

Taxonomic Position — At one time I considered this organism to be a *Streptococcus* but its almost constant Gram negativity and the presence after some subculturing on tryptic agar of numerous coccobacillary and bacillary forms would appear to make this classification incorrect For the time being for convenience sake it might be continued to be known as *Micrococcus metamyceticus* until further investigation will re-determine its taxonomic position

Pathogenicity — All the strains seem to be of very low virulence as a pathogen for the ordinary laboratory animals (rabbits and guinea pigs) when inoculated subcutaneously intravenously or intraperitoneally In monkeys a recurrent type of fever may develop but no signs of elephantiasis have occurred

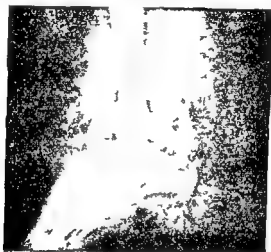
Pathology — The sequel of pathological changes is as follows

- (1) Acute inflammation of certain lymphatics and lymphatic glands occurs due most probably to bacterial invasion
- (2) Owing to the pathological changes produced in the lymphatics by the bacteria and their toxins oedema develops which later becomes solid oedema
- (3) The oedematous stage is followed by hyperplasia which affects the skin and subcutaneous tissues

The portal of entrance of the bacterium is usually an abrasion or small wound in the legs or feet but in some cases the portal of entrance cannot be detected and distant infective foci have been suggested

Morbid Anatomy — Very little is known with regard to the morbid anatomy of the disease apart from data collected at operation but it would appear that the lesions are very similar to those found in filarial elephantiasis the lymphatics being dilated and the inguinal glands of the affected side being often enlarged and there may be oedematous periadenitis In cutting into the skin of the affected limb it will be noted that the skin is greatly thickened and in the subcutaneous tissues there will be found dense fibrous trabeculae with spaces filled with yellow oily blubbery fatty substance which exudes lymph

Histopathology Epidermis — With regard to the epidermis the stratum corneum is hardly thickened in cases of elephantiasis nostras glabra while it is thickened in cases of elephantiasis nostras verrucosa. The rete Malpighii layer is not usually thinned in elephantiasis nostras glabra but it is very greatly thinned in elephantiasis verrucosa. In both types the nuclei of the cells of the Malpighian layer are usually very close together this showing great diminution or absence



Elephantiasis nostras English case X ray photograph of foot and lower portion of leg Bones not affected

of cytoplasm in the cells the prickles in many cases are not seen. In the verrucose type finger like outgrowing processes are noted covered by a loose thickened horny layer.

Derma and Subcutaneous Tissue — These are greatly thickened and here and there small accumulations of small round cells are at times seen especially in the papillary layer. The open lymph spaces are usually very prominent and very numerous the arterioles are greatly thickened the intima showing special hypertrophy there is seldom thrombosis. The connective tissue in some cases is very loose and looks oedematous in parts the cells are branched as seen in mucoid degeneration.

In brief the principal histological features of the skin in elephantiasis nostras are (1) Great thickening of the dermal and subcutaneous tissues (2) close approximation of the nuclei of the Malpighian layer and great diminution or absence of cytoplasm with almost total absence of the prickles (3) large numbers of



X ray photograph of case of Elephantiasis nostras
Bones not affected

prominent open lymph spaces (4) thickened arterioles (5) fibrosis. These features are practically identical with those found in filarial elephantiasis.

Prognosis — The prognosis always tends to be favourable *quoad vitam* but when the disease has fully established itself and reached

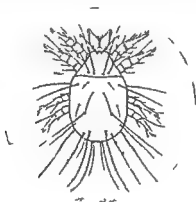
the pachidermic stage it may be considered incurable although life is not endangered

Treatment — During the acute pyrexial attacks of lymphangitis sulphonamides and antibiotics may be tried although the results are not brilliant and in my experience never dramatic Chloromycin seems to be the most useful antibiotic one capsule (grm 0.25) every three hours Penicillin has been worthless in my cases Neither the sulpho namides nor the antibiotics including chloromycetin seem to be capable of preventing recurrences of the febrile attacks For this purpose in several cases I have found of advantage the administration of *M. metamyceticus* vaccine but it must be given regularly once or twice a week for many months and even years When the pachidermic stage has developed the recurring fever attacks generally cease spontaneously but neither sulphonamides nor antibiotics nor vaccines have any influence on it Surgical operations — many have been devised — give very unsatisfactory results except in elephantiasis of the scrotum In practice the method of treatment I have found of some real usefulness although merely palliative is that which I introduced for tropical elephantiasis many years ago in Ceylon The patient is placed at complete rest in bed and the affected leg is kept somewhat raised by means of cushions and is bandaged with crepe bandages taking care that the maximum of the pressure should be on the foot and instep and should gradually decrease upwards Three times a week an injection of fibrolysin Merk (2.4 cc) is given in the gluteal region After 2-3 months of this treatment the dimensions of the limb are usually very greatly diminished and the leg may appear almost normal In some of these cases elongated ovaloid strips of skin and subcutaneous tissue may then be removed and the wound sewn up Unfortunately the results are only temporary and sooner or later the pachidermia will develop again although the regular use of crepe bandages and elastic stockings may delay it

Culture of *Micrococcus metamyceticus* are available

SKIN DISEASES OF PARASITIC ORIGIN (ANIMAL)
COPRA ITCH

This dermatitis was described by me in Ceylon in 1911 in people handling copra. The condition is due to an acarid like parasite *Tyroglyphus longior* Gervais 1844 var *castellani* Hirst 1912 which swarms in many samples of copra and may occasionally be found on the skin of the patients though it does not remain there since it does not bury itself. Apparently the mite induces the dermatitis in



Tyroglyphus longior var *castellani* (Drawing)

the same manner as *Pediculoides ventricosus* Newport which lives in diseased cereals and produces an eruption in persons handling such cereals.

A description of this mite and others of the same group may be found in Castellani & Chalmers Manual of Tropical Medicine London 1919 pag 729

Experimental reproduction — When copra dust containing the mite is rubbed into the skin itching frequently begins very shortly after and twenty to forty eight hours later an extremely pruriginous urticarial or papuloid eruption often develops. The same result is obtained by picking the mites out of copra dust and placing them (alone without any dust) on the skin under a covering such as a

piece of lint kept in place by a bandage. The pustular stage which is due to scratching and secondary pyogenic infections did not occur as there was no time for it to develop since all the people refused to go on with the experiment after the second day. Some individuals seem to be unaffected by the presence of the mite or the copra dust containing it.

Recently a form of copra itch due not to the adult mite but to larvae of this and other mites has been described.

Symptomatology — The hands, arms, legs and sometimes the whole body except the face present fairly numerous very pruriginous



Tyroglyphus longior var. *castellanii* as found in copra dust

papules often covered by small bloody crusts due to scratching. papulo pustules and pustules are also generally present. The eruption has no tendency to spontaneous cure while the patient goes on working in the infected mills.

Diagnosis — On superficial examination the condition may easily be mistaken for scabies but burrows are not present and the two parasites are very different.

Treatment — The best treatment is the daily application of beta naphthol ointment (6 to 10 per cent). The action in these cases cannot be compared to what takes place in scabies as in copra itch the acarous like mites remain for only a short time on the body and in most cases when the ointment is applied at night the parasites are

no longer there. It may act as an antipruritic antiseptic and in this way diminish scratching and secondary pyogenic infections.

It is probable that a small amount of the ointment may remain on the skin after the morning bath and be repellent to the mite in this way preventing the daily reinfection which otherwise takes place.

WOUND MYIASIS

During World War II in many parts of the tropics and subtropics and especially in North Africa war wounds often became heavily infested with larvae of various flies (*Chrysoma*, *Cordylobia*, *Sarcophaga*).

Notwithstanding the old belief that certain larvae not only are harmless but beneficial in my experience wounds always became much worse when so infested. I had the luck of finding an extremely simple and very efficacious treatment: simply pour on the wound and on the dressings a large amount of ether (sulphuric ether); the larvae are killed almost instantaneously and no inflammation is caused. More particulars will be found in my book on African Diseases (Malattie dell'Africa, Rome, 1947).

The reader interested in myiasis and its aetiology might perhaps still find of interest perusing the old chapters on the subject in Castellani & Chalmers' *Manual of Tropical Medicine* (London, 1919) chiefly chapt. 33 p. 814, chapt. 35 p. 87 and chapt. 67 p. 1619.

SKIN DISEASES OF UNKNOWN OR DOUBTFUL CAUSATION DERMATOSIS PAPILOSA NIGRA

This condition which was described by me some years ago (*Diseases of Central America*, *Journ. of Trop. Med. & Hyg.* 1925, xxviii, 1) seems to be extremely common in negroes in Jamaica and Central America but I have also seen cases in negroes in Louisiana and other parts of the United States who have never been abroad and I have also seen cases in Africa.

In a well marked case a large number of black or darkish brown papules, somewhat cupuliform or at times flattened, are seen on the

face principally on both malar regions they are usually rare or absent on the lower parts of the face and chin though a few may be present on the forehead. They are not pruriginous or painful the maximum diameter of each papule varies between 1 mm and 4 or 5 mm. In early cases the surface of the papule is smooth but later it may become slightly rough and verrucoid. At times two or three papules appear during youth often at the age of puberty or soon after. I have seen these papules present in small numbers in boys and girls of 14 to 18 years of age. The condition gradually becomes



Dermatitis Papulosa Nigra

more marked the papules increasing in number and size as the patient becomes older it is not unusual to see middle aged men and women with their faces studded with these black papules.

Histopathology — This has been studied by myself in conjunction with Professor Charles Duval. The sections for histological study were fixed in Zenker's fluid paraffin blocks were made and the specimens cut and stained with haematoxylin and eosin. The epithelium is somewhat shrunken and the stratum corneum is rather poorly represented except the keratinization of the surface is marked in certain areas. The stratum granulosum seems increased in amount

The pars papillaris of the derma is greatly increased in intensity presenting a cheloid appearance. In many areas this forms a protuberant and branching projection which assumes a papillomatous arrangement although the layers of the surface epithelium have not proliferated. There is some increase of the melanin in the deeper layers of the epidermis.

Etiology — The etiology is unknown but it would seem that race is a predisposing aetiological factor the condition is extremely



Dermatosis papulosa nigra. Histological section.
Note great amount of pigment.

common in Jamaican negroes. I have however seen cases in mulattoes and one in a European who was born and brought up in Jamaica and also in negroes who were born in Louisiana and other states of the Union. I have seen also cases in Africa. Some authorities consider it to be of nevus origin although it never develops before puberty.

Diagnosis — The condition is to be differentiated chiefly from juvenile verrucae and from senile warts. In early or comparatively early cases the papules do not have the appearance of ordinary juvenile verrucae lacking the well marked verrucose surface and pruritus common to this condition nor do they have the appearance of senile warts which are much larger and have a greasy surface.

Prognosis — The condition does not influence the general health of the patient but has no tendency to spontaneous cure. Generally it becomes progressively more marked with age.

Treatment — Treatment is unsatisfactory. The papules may be destroyed by using the micro burner or a strong solution of formaldehyde but as a rule small white scars remain permanently. The coloured people object to these much more than to the black papules.

MACROLICHEHN

(DERMATOSIS PAPULOSA SOMALIENSIS)

Terminology — I have suggested for this condition described by me in 1935 (British Journ. of Dermatology October 1935) the term *macrolichen* owing to the presence of large pruriginous papules although neither clinically nor histologically has the disease any close resemblance to *lichen planus*. An alternative term might be *dermatosis papulosa somaliensis* as all cases have so far come from Somaliland. No doubt however further investigation will probably show that this dermatosis is present in other countries.

Symptomatology — The condition begins with severe pruritus on the legs usually in the anterior aspect and after a short time papules develop. In a well marked case a fairly large number of papules are seen on the skin of both legs which may be follicular or non follicular roundish or somewhat flattened seldom acuminate never umbilicated of various sizes up to that of a small pea of firm consistency of the colour of the skin or of reddish colour or whitish in Europeans they are discrete or aggregated in groups. The intervening skin is usually of normal appearance although a few excoriations may be present due to scratching. There is as a rule no pustulation or ulceration. The course is chronic extending often to four or five years or even much longer. The eruption seems to remain localized to the legs. There is no hyper pigmentation. Some papules may disappear spontaneously leaving no pigmentation at times a slight depigmentation may be noted.

ILLUSTRATIVE CASE

Mr. T. H., aged 28 years, single, went to Italian Somaliland years ago and remained there three years. He came to consult me in March 1934, owing to a very severe pruritus on the legs which had developed while he was in Somaliland. His general condition of health was satisfactory; nothing to be noted at the examination of the various systems. The blood was normal, no eosinophilia. Wassermann negative, urine normal. The examination of the stools did not show presence of helminths.



Macrolchen

no protozoa or pathogenic bacteria. The examination of the skin revealed the presence of a papular eruption localized to the anterior aspects of the legs. The papules were fairly large, up to the size of a small pea. Most of them were non-follicular, a few were follicular. Some of them were closely aggregated but remained isolated with no tendency apparently to coalesce into plaques. The intervening skin was normal, but a few superficial excoriations due to scratching were present. The superficial lymphatic glands (inguinal, etc.) were not enlarged. The oral mucosa was normal. The papules were pinkish or reddish, a few especially among the smaller ones were pale. Most of them were roundish, none showed a typical polygonal outline or a central umbilication, and none was surrounded by a zone of hyperpigmentation.

A biopsy was made and the sections were investigated histologically with the kind assistance of Dr Macken ie Douglas and Dr Acanfora. The histopathology as given in the general description is based on the investigation of these sections. The peculiar bodies which will be described under histopathology were noticed by me.

Microscopical and Bacteriological Investigation — The microscopical examination of film showed nothing characteristic and the bacteriological examination of the papules did not show any specific germ on some media a few cocci grew.

Course — I saw the patient again several times during the period 1936-41. The condition was practically the same and the pruritus was still severe although apparently less severe than at the beginning. His general condition of health was excellent.

Histopathology — The description is based on sections of a small nodule removed by biopsy from the illustrative case quoted above.

The corneal layer is somewhat scaly. It remains however intact over the nodule of chronic inflammatory tissue. Remains of an old haemorrhage can be seen between the outer layers.

The *anular layer* is very distinct with well marked ketatohyalin granules.

The *Malpighian layer* shows at the margin of a nodule steep interpapillary processes (alpine) but over the apex of the nodule the processes are flattened out and at places invaded by pale staining fibrous tissue extending from the corium. Prickles between the cells can be well seen at some places.

The *cylindrical layer* contains pigment granules but not in excess. This layer cannot be distinguished at some places over the apex of a nodule.

The *cutis vera* shows a fairly well defined nodule mainly in the papillary layer. In this there are dilated capillaries surrounded by small round cells epithelioid cells and eosinophiles. Elongated cells with basophil granules are also present. No giant cells and no caseation are seen. The appearance is that of a still active but chronic inflammatory condition. Very few polymorphonuclear cells are seen. Over the defined nodule the epidermis is stretched and the papillary processes have disappeared. On the superficial area of the papillary layer of the derma are nodules and cysts in which the structure of the epidermis can be easily demonstrated. The outer portion of these nests consists of layers of cells of the Malpighian layer which show distinctly characteristic prickles. Nearer the centre is a well marked granular layer and the centre is composed of concentric layers of cells of the same nature degenerated. The appearance is that of a small portion of the epidermis nipped off by the chronic inflammatory tissue and forming a well-defined and regular nodule not unlike cell nest in an epithelioma. The definite arrangement of the layers, the absence of epithelial cell out of the usual relationship and the long history in conjunction with the chronic inflammatory tissue differentiate it from a malignant growth. In a tangential section of a small epithelial mass it can be seen that growth is active. In the outer or germinal layer can be seen regular mitotic figures. Four are seen in the section, two of these being in focus.

Some interesting and quite distinctive bodies are seen lying in oval interspaces in the Malpighian granular and corneal layers of the epithelium. With haemato-

xyl in and eosin stain they are coloured pinkish and stand out well from the darker stained tissues around them. They are oval in shape and appear to have a capsule and look like parasitic bodies which have not been identified. Most of them show a clear space around them while the surrounding cells of the epithelium are compressed as if forming a bed in which they lie. With haematoxylin-eosin the structure is not distinct and some dark staining points are indeterminate. In sections stained by Giemsa a very fine magenta-stained blue is seen inside which



Macrolchen

the capsule is faintly not stained while the main substance of the body is blue. In some there is faint suggestion of a clear white zone. One body lying in the mucous layer shows a distinct capsule with five oval deep blue staining masses which look like the coils of a parasite cut in section. The smallest of the bodies is about 13.5 microns and the largest about 30 microns. The average diameter of ten bodies in different sections is 22.5 microns; the separate measurements in microns being 30, 14, 21, 23, 27, 27, 13.5, 23, 20. Photographs show these bodies which do not resemble the cells adjacent. They are suggestive of the appearance

rance of parasitic structures. Are they larvae or eggs, protozoa or peculiar fungal cells? It is impossible to say anything definite at the present time; the problem should be further studied. These structures do not seem to be ordinary degenerated cells.

Etiology — This is unknown but the peculiar bodies described above should be investigated further.

Diagnosis — This is based on the presence of fairly large, very pruriginous papules and small nodules on the legs, follicular and non follicular, which have no tendency to coalesce, although some of them may be closely aggregated; they do not ulcerate, are not hyperpigmented, and those which disappear spontaneously do not leave zones of hyperpigmentation; they do not show any umbilication or a polygonal outline and do not present a verrucoid surface.

Differential Diagnosis — The condition differs from lichen planus clinically and histologically. The papules are never umbilicated or polygonal and there is absence of hyperpigmentation. Moreover, in the cases I have seen the lesions were localized to the legs only.

With regard to lichen obtusus and lichen hypertrophicus, these are merely varieties of lichen planus, and on thorough examination a few typical papules of lichen planus will generally be found. In addition, some lesions usually coalesce, producing thickened patches with a rough, at times warty surface surrounded by a halo of hyperpigmentation.

Keratosis pilaris begins at a very early age; the papules are all follicular and mostly contain a corneal cone; the histology is quite different.

Papular avitaminic eruption (phrynoderma) affects the whole body; it is cured by giving vitamin A.

Prurigo begins in infancy or childhood and the lymphatic glands are usually enlarged. In prurigo nodularis the lesions are of larger dimensions and are not limited to the legs.

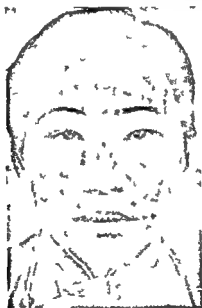
In creeping disease there are no papules or nodules but slightly elevated serpiginous lines.

Prognosis — This is good *quoad vitam* but the condition apparently runs a course extending to years with little or no tendency to spontaneous cure.

Treatment — Alcoholic solutions and ointments containing salicylic acid (2 %) or beta naphthol (1 %) seem to induce an improvement X ray therapy may be tried Vitamine and antibiotics tried in recent cases appear to be useless

POST PRICKLY HEAT NODULO PYODERMA

This condition was noticed by me many years ago in Ceylon and mentioned and briefly described in local publications I consi



Case of Post Prickly Heat Nodulo pyoderma (after Reiss)

dered it closely related to pyosis nodularis — merely a variety of it — and grew from the cases the usual pyogenic cocci I believed it to be often a complication or sequel of *miliaria rubra*

It differs from the typical pyosis nodularis in the face being usually the region most affected Reiss has investigated the disease

in China and has called it *syringadenitis suppurativa tropicalis* (Journ Labor Clinical Med Vol 28 No 9)

Numerous nodules are present mostly of the size of a split pea. Some never come to suppuration and slowly disappear without leaving any mark others suppurate and leave small scars and hyperpigmentation. Occasionally there may be slight fever and according to Reiss there is often hypoglycaemia. The condition may last several weeks and even months.

Histologically the sweat ducts are dilated and invaded by leucocytes and cocci. Rarely the sebaceous glands are involved. Reiss as stated has called the condition *syringoadenitis tropicalis*. He does not give importance to the pyogenic cocci present and considers the affection due to lack of vitamin C.

Diagnosis — The eruption looks very much like an iodine or bromide rash but the history rules this out.

Treatment — In the old days before sulphonamides and antibiotics were introduced the treatment was difficult the best being by vaccines. At present penicillin is given by injection and sulphonamides by mouth. Aureomycin Chloromycin Terramycin and other more recent antibiotics may be prescribed. Local treatment consists in sponging with a 2% alcoholic solution of salicylic acid. Reiss advises ascorbic acid in large doses (grm 0.20-0.30 daily).

MAMMILLARIA

This condition was noticed many years ago by Chalmers and myself in Ceylon but we did not give it a name considering it merely a sequel of prickly heat as in reality it is. It is characterized by the presence of very numerous small pale elevations which although very closely set never fuse together to form plaques. It has been studied in recent years by a number of workers among whom Horne and Mole (Trans R S Trop Med 1950 pag 150).

ERYTHEMA BLASTOMYCETOIDES
ERYTHEMA TUMIDUM BLASTOSIMULANS)
(ERYTHEMA TUMIDUM MAMMILLATUM)

I have seen two cases of this peculiar condition which as far as I know has not been described before. Numerous aggregated ele



Case of Erythema Blastosimulans. The erupt on lasted a few weeks and disappeared abruptly

vated polygonal or roundish patches each of which $\frac{1}{2}$ to 3 cm and more in diameter. Where present the surface appears mammillated showing numerous small oft pinkish elevations which are never ulcerated. In both cases the region of the body most affected was the back of the neck. The lymphatic glands were not enlarged. Gene

ral health not affected No pyrexia no pruritus no pain no tenderness no dermatographia The blood did not show any abnormality Wassermann test negative Urine normal Microscopical and cultural examinations of the lesions for fungi bacteria and protozoa negative

The diagnosis is most difficult Both cases were sent to me as possible cases of blastomycosis but in both the eruption had appeared abruptly In both the complaint which had resisted all kinds of treatment disappeared almost suddenly after about eight weeks from the onset without leaving any mark In my opinion the condition is probably of the nature of erythema polymorphum although all the lesions were of the same type

DERMATITIS NODOSA RUBRA

This condition was observed by me in Ceylon many years ago I gave a description of it in Castellani & Chalmers Manual of Tropical Medicine (1919) pag 2249

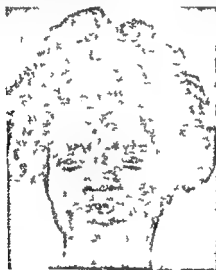
The aetiology is unknown the histopathology shows no characteristic features but has not been completely investigated

Symptomatology — The first impression received on seeing a patient suffering from this peculiar disease is that he is suffering from smallpox in the papular stage of the eruption but the absence of fever and the closer inspection of the eruption will exclude smallpox at once In a well marked case the patient presents on his face arms chest back and practically the whole body numerous large papules and nodules The colour of the eruptive elements is an angry red the shape hemispherical or roundish the size from a small split pea to a large pea The surface of the papules and nodules is smooth does not show umbilication nor scales their consistency is hard most of the papules are not follicular There is unbearable pruritus but the malady has no urticarial element whatever Several of the superficial lymphatic glands are enlarged and hard Spleen not palpable In several cases a well marked enlargement of the parotid gland is present The blood shows a certain degree of eosinophilia no leucocytosis The course of the disease is long — six months to a year and sometimes much longer the nodules become gradually smaller

and may disappear completely they leave no scar or zones of hyperpigmentation but occasionally the skin takes a slightly scaly or exzematoid appearance. Recurrences may be observed.

Diagnosis — From a *syphilide* by the extreme pruritus the negative Wassermann and the inefficacy of antisyphilitic treatments.

From *smallpox* the papular stage of which it closely resembles by the absence of fever by the chronic course and by the fact that



Dermatitis nodosa rubra

the papules never undergo a purulent change nor leave scars on healing.

From *lichen planus* by the papules being very large and by their not being flattened umbilicated nor polyhedral.

From *pityriasis rubra pilaris* by the papules being very large and most of them not follicular and by the absence of plugs and scaling.

From *folliculitis* by the condition not being limited to the extremities and by the absence of central crusts.

From *erythema multiforme* by the eruptive elements being well defined persistent solid papules and nodules

Prognosis — In most cases the general health is not much affected but the patient complains of the disfigurement and the severe



Dermatitis nodosa rubra

pruritus and the course of the disease is a long one. Occasionally after many recurrences death ensues.

Treatment — Arsenic, potassium iodide, mercury do not influence the disease. To allay the pruritus, salicylic alcohol lotions (2 per cent) and ointments may be used. Sulphonamides and antibiotics were not tried as the cases were studied before such drugs came into use.

DERMATITIS NODULO PUSTULARIS ABACTERICA DISSEMINATA

The first impression on seeing a patient affected with the disease is that patient is a case of generalised syphiloderma pustulosum. If fever were present one might also easily think of smallpox. The



Case of nodulo pustulosis abacterica in a young girl aged 17. Tuberculin test negative. Wassermann test negative.

patient is in good general health but the whole body is covered by papules and papulo pustules some follicular some non follicular the size of a millet seed to a small pea.

Pustular lesions may be found also on the oral mucosa. The superficial lymphatic glands are not enlarged or only slightly.

The eruption lasts some weeks and then disappears the papulo pustules and pustules involuting without rupturing and without usually

leaving scars. Some papulo pustules may show a necrotic apex but as a rule no scarring results. After a few months however there is usually a relapse. Several relapses may occur during a period of two to three years. The microscopic and cultural examinations of the pustules show absence of parasites and bacteria.

The condition has to be differentiated from a tuberculide, scars not being left when the lesions involute and the tuberculin test being negative. It differs from dermatitis nodularis necrotica of Werther in the absence of scars and absence of haemorrhagic lesions. It differs from papulo pustular syphilodermia by Wassermann being negative. It differs from all known common pyodermata in the papulo pustules and pustules not containing pyococci or other bacteria.

The treatment is most difficult. Penicillin in very large doses is definitely useful.

DERMATITIS MONOBULLARIS ABACTERICA (MONOBULLA ABACTERICA)

The patient complains of discomfort and pruritus localized to a small area of the arm and more rarely of the trunk. He looks at the part and notices a rather large perfectly roundish red patch the size of a shilling to a half crown. The patch may be slightly elevated and is usually sharply margined. One or two days later a large bulla forms in the centre of the patch or occasionally at the periphery of the patch. It is usually at this stage that the patient will seek medical advice.

Rarely the patient thinks that the patch developed at the site of an insect bite and on these rare occasions he is very vague about it. He does not know what insect bit or stung him and no haemorrhagic spot is seen marking the site of the bite or sting. When fully developed the bulla is the size of a large pea or that of a bean or even a small cherry. It may be tense or flaccid. It is filled with clear serum.

Etiology — The cultural examination of the liquid of the bulla carried out in the usual way employing the ordinary laboratory media is negative. In films from the serum stained by Giemsa's numerous coccoid or coccobacillary bodies stained pinkish or reddish are often

seen closely resembling rickettsiae. The subject requires further research. Personally I believe that sooner or later it will be demonstrated that some insect has to be incriminated although not the ordinary blister beetles as all my cases were observed in Rome where blister beetles are unknown.

Course — The affection takes about 2-3 weeks to heal spontaneously. As a rule only one bulla is present during the whole course. There is no fever and never any sign of lymphangitis or secondary pyogenic infection.

Diagnosis — This is based on the presence of a perfectly round large (2-3 cm) red pruriginous somewhat elevated infiltrated patch in the centre of which after 24-48 hours a large bulla forms with aseptic contents.

In dermatitis bullosa from blister insects as a rule there are several bullae often arranged in a line and the bullae arise «d'emblee». Bed bugs produce oedematous nodules.

Treatment — The fuchsin paint which goes by my name applied twice daily greatly accelerates the cure.

DERMATITIS BULLOSA ASEPTICA SYMMETRICA PALMARIS ET PLANTARIS

Large bullae are seen on the palms of the hands (occasionally also on the backs) and similar bullae may be present on the soles of the feet. They may be tense or flaccid. Their size varies from that of a pea to that of a bean.

Usually there is little or no pruritus and hardly any pain or tenderness. The intervening skin does not show signs of inflammation. There is no hyperkeratosis and no marked desquamation. The bullae may rupture spontaneously and then raw areas are seen which may become occasionally infected. The disease runs a very long course usually many years with prolonged periods of complete disappearance of the eruption.

The general condition of health remains good The Wassermann test is negative The microscopical examination of the blood does not show anything abnormal no eosinophilia The serum of the bullae is aseptic

The condition is not a form of *pemphigus vulgaris* as although there are many relapses the prognosis is good *quoad vitam*

It may be related to Andrews bacteride but exfoliation is much less marked in fact practically absent and in all my cases no focus of infection could be found It may possibly be related to *psoriasis pustularis* although in none of my cases psoriasis lesions were present It has been suggested that it is a form of epidermolysis bullosa and that it is related to Weber's Syndrome although there are no seasonal recurrences

The treatment is very unsatisfactory Resorcin and salicylic lotions and ointments are useful Arsenic internally seems to do good in some cases

ACRODERMATITIS VESICULOSA TROPICA

This disease was described by me in Ceylon (Castellani & Chalmers Manual of Tropical Medicine all editions) It is of rare occurrence

The aetiology is unknown but the affection may be of neuritic origin It does not seem to be connected with leprosy in all my cases the search for Hansen's bacillus being negative and anaesthesia and other signs of leprosy being absent No history of traumatism was elicited in my patients

Symptomatology — In a well marked case the skin of both hands especially the fingers appears glossy and tense the fingers often assuming a tapering shape Translucent vesicles the size of a millet seed or a little more are seen deeply embedded in the skin of the fingers They have clear contents and the bacteriological examination reveals absence of any bacterium They may remain unchanged for a long time then may slowly disappear or a few may break leaving very small superficial ulcers which heal spontaneously and do not coalesce The patient generally complains of very severe

pain in the hands and fingers which may be continuous or may be of neuralgic intermittent type Pruritus is absent There is often diffuse hyperaesthesia anaesthesia is never present No thickenings are found along the nerves of the arm The general health is not affected

Course and Prognosis — The course of the disease extends to several months and occasionally to two or three years with periods of great improvement Ultimately the condition may get cured spontaneously The general health is not affected but the patient is unable to work with his hands

Diagnosis — This is based on the patient complaining of severe pain in the hands and fingers on the presence of deep seated cheiropompholyx like vesicles on the glossy skin and on the long course of the complaint

The condition is differentiated from cheiropompholyx by the severe pain and absence of hyperidrosis from a leprotic condition by absence of anaesthetic patches and absence of other signs of leprosy on other parts of the body Moreover although the course is long the disease generally becomes cured spontaneously From dermatitis repens of Crocker and acrodermatitis perstans of Hallopeau by there not being history of traumatism by absence of exfoliative lesions by the less severe objective signs and by the absence of the large foci of disease with marked borders and fringed with sodden epithelium

Treatment — The regular application of an ichthyol ointment (2 to 5 per cent) to the hands and fingers and the administration of the same drug (grm 0.20) three times daily by mouth is beneficial

ACNE NECROTICA PROFUNDA VEL MALIGNA

The ordinary type of acne necrotica (acne frontalis acne varioformis) is quite common in the tropics but I should like to call attention to the extremely severe type of it of which I have seen two

The general condition of health remains good. The Wassermann test is negative. The microscopical examination of the blood does not show anything abnormal, no eosinophilia. The serum of the bullae is aseptic.

The condition is not a form of *pemphigus vulgaris* as although there are many relapses the prognosis is good *quoad vitam*.

It may be related to Andrews' bacteride but exfoliation is much less marked, in fact practically absent and in all my cases no focus of infection could be found. It may possibly be related to *psoriasis pustularis* although in none of my cases psoriasis lesions were present. It has been suggested that it is a form of epidermolysis bullosa and that it is related to Weber's Syndrome although there are no seasonal recurrences.

The treatment is very unsatisfactory. Resorcin and salicylic lotions and ointments are useful. Arsenic internally seems to do good in some cases.

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ACNE NECROTICA PROFUNDA VEL MALIGNA

The ordinary type of acne necrotica (acne frontalis acne varioformis) is quite common in the tropics but I should like to call attention to the extremely severe type of it of which I have seen two

cases One contracted the disease in Brazil the other in Tropical Africa

The lesions are found not only on the forehead but also and in fact chiefly on the cheeks and nose At complete development they are narrow ovaloid elipsoid deep ulcers followed after a long time by large disfiguring scars

Each lesion appears to begin as a folliculitis and the bulb of the extracted hair is encased in a mucilaginous substance

All microscopical and bacteriological examinations for a specific germ are negative Only a few ordinary pyococci are present

The course of the disease is very prolonged 5 to 6 years and longer

The only treatment that gives fairly good results although only temporary ones is by X rays

KERATOMA PLANTARE SULCATUM

Historical and Geographical — This disease was first described by me in Ceylon A description of it was given in all the editions of Castellani & Chalmers Manual of Tropical Medicine In the third edition (1910) it is given at pag 2258

Etiology — This is unknown The affection is much more frequent during the rainy season and occurs generally in natives who do not wear shoes or sandals but I have seen a typical case in a European of good social standing It improves or disappears completely during the dry season According to Acton and Macquire the disease is in reality a form of keratolysis rather than hyperkeratosis Acton and Macquire have grown an actinomyces (*Actinomyces keratolyticus*) from most of their cases which produces proteolytic enzymes The fungus grows best under aerobic conditions and at blood heat 37 C The cultural characters are similar to the red and black fungi found in certain cases of mycetoma of the foot Acton and Macquire's results have not been generally accepted C G Aars who made a thorough investigation of the disease in South America (Arch of Derm & Syph 271 1931) suggested the name kerato dermia plantaris sulcata (Castellani)

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LITTLE KNOWN TROPICAL

Symptomatology — The ep
anterior portion — and the heel
rally of a dark yellowish co
segmentary furrows straight se
appear black but if the dirt and
the fundus of these sulci will be
is no sign of any local inflama
complains of tenderness of the



keratoma

Diagnosis — This is based
deep sulci and punched out hol
are absent in lesions of the sole

Moreover the Wasserman
treatments have no effect wh
lesions of the soles of the feet

Prognosis — The general health is not affected but the condition may last for months and if the patient has much walking to do may become very painful

Treatment — Antisyphilitic drugs are useless Rest and local applications of salicylic ointment or salicylic collodion (ac salicylic



Keratoma plantare sulcatum

3 grm 4 collodion grm 30) or salicylic plasters induce a marked improvement

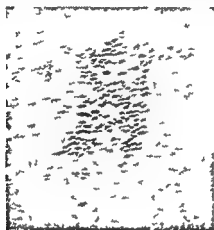
LICHEN CONVEX (LICHEN PILARIS CONVEX)

This affection — which has been described by me — is very common in Ceylon especially among natives A description of it

with illustration was given in Castellani & Chalmers Manual of Tropical Medicine (1919)

Symptomatology — The regions of the body most affected are the chest dorsum and shoulders. The disease is characterized by the presence of numerous firm small papules all of which are follicular.

The surface of the papules is smooth no squamæ or plugs are found they have always a convex surface and may be almost



Lichen Convex

hemispheric $\frac{1}{12}$ to $\frac{1}{8}$ inch in diameter. The colour of the papules has a pinkish hue in natives and red in Europeans they have no inflammatory base they are not surrounded by any halo of inflammation nor is there hyperpigmentation nor do they leave pigmented areas on healing. The eruption is very pruriginous. The region affected may show hyperidrosis. The general health is not affected the lymphatic glands are not enlarged in a few cases the blood may show a slight degree of eosinophilia.

The course is long the eruption lasting three to nine months and often recurring. When the eruption heals no hyperpigmentation is left.

Diagnosis — From *Pityriasis rubra pilaris* by the papules never showing plugs and by the absence of scaling from *Lichen planus* by the papules not being flattened nor polygonal nor umbilicated from *Lichen nitidus* by the papules being follicular and most pruriginous from *dermatitis nodosa rubra* by the papules always being small and follicular from *papular eczema* by the papules always being follicular and larger and dome like with absolutely no inflammatory base and by the skin not presenting a diffuse inflammation and no moist lesions whatever the stage of the disease Moreover even when the eruption is of long standing the appearance of the skin between the papular elements remains quite normal and there is no sign of what the French call *lichenification*

Prognosis — The eruption lasts for several months but generally heals spontaneously recurrences occur The general health is not affected

Treatment — Potassium iodide mercury and arsenic have no effect Externally antipruriginous lotions and ointments may be used — as for instance a salicylic alcoholic lotion (2 per cent) followed by a naphthol ointment (2 to 5 per cent) A change to a cool climate is very beneficial

MICROPUSTULOSIS KERATOGENICA SPINULOSA OF THE LANUGO HAIR

(MICROPUSTULOSIS FOLLOWED BY LICHEN SPINULOSUS)

On the skin of the chest and occasionally of the shoulders and other parts of the body minute pustules the size of a millet seed and less are seen each pierced by a lanugo hair The pustules are aseptic By a peculiar keratogenic process after a time the minute pustules without usually rupturing are transformed into corneal elevations or papules often surmounted by a horny spine so much so that the eruption in this later stage can hardly be distinguished from lichen spinulosus

SUBCUTANEOUS POLYMICROLIPOMATOSIS

This condition described by me in Ceylon (Castellani & Chalmers Manual of Tropical Medicine) seems to be common in the tropics in Europeans and natives alike. It is characterised by the presence of subcutaneous nodules found only on palpation roundish or oval painless the size of a pea to a small nut. They are generally situated in the subcutaneous tissue of the arms, legs and abdomen and in our experience are not rarely mistaken for enlarged lymphatic glands. On tapping them with a sterile syringe only a trace of fatty material is removed which when placed on a slide promptly



Seborrhoea nodular and spinulosa (top of the nose)

dissolves when heated or treated with ether. The microscopical examination of one of these nodules surgically removed showed it to be composed of fatty tissue. Occasionally the tumours become much larger and may be plainly visible as ordinary lipomata.

MULTIPLE MICROCHELOID OF UPPER LIP

Occasionally one comes across a middle aged European woman showing on the upper lip a number of extremely minute discrete or at times closely aggregated whitish cheloidal elevations the size of a pinpoint to that of a very small pinhead. This condition develops

years after electrical epilation for hypertrichosis of the upper lip. No treatment is of any avail. «Cover mark» and similar preparations may hide the condition.

SEBORRHOEA NODULARIS ET SPINULOSA

This condition has been observed by me in various parts of the tropics and the Balkans. It is characterized by the presence of numerous yellow plugs, some of which may be acuminate and hard, several millimetres in length. These plugs project from the orifices of the pilo sebaceous follicles and are often situated on an oily skin. Ordinary black comedones are absent.

LIPOTROPHIA ALBOSURICA

(Subcutaneous fatty tissue atrophy and albumosuria)

This disease was described by me in the Anais do Instituto de Medicina Tropical De.embro 1946

Symptomatology — The onset is very slow. Usually the patient complains for some time of feeling tired and disinclined to work. Then the skin of some regions of the body, chiefly the arms, develops a mottled appearance due to the presence of reddish or purplish spots. There may be some neuralgic pain. Slowly the subcutaneous fat tissue disappears and the skin hangs down in folds. The course is very chronic, the disease lasting for several years. The progress is fairly rapid for a period, then becomes extremely slow, may stop altogether, and occasionally there may be an improvement. In one of my cases, the case seen in England, the condition had been present for four years when I first saw him. The patient died two years later from an intercurrent disease (pneumonia) after a slight but definite improvement in the skin condition had taken place.

Blood — A slight anemia of the hypochromic type may be present. The number of leucocytes is about normal and no eosinophilia has been noted. The number of lymphocytes may be much above the normal. The differential count in one of my cases — the English one —

gave the following result Polymorphonuclears 52 per cent lymphocytes 43 per cent large mononuclears 3 per cent eosinophiles 2 per cent

Urine — The urine contains a large amount of albumose. On heating cloudiness appears long before the boiling point is reached it begins to appear at 50 C and increases to a heavy turbidity by the time boiling point is reached. If then a large amount of 20 per cent acetic acid is added (2 cc of it to 8 cc of urine) the cloud clears to a great extent or disappears completely to return on cooling.



Lipodystrophia albumosuræ a

Etiology and Pathology — Nothing is known regarding the etiology of the malady. Examination of sections of the skin obtained by biopsy in one of my cases showed practically complete disappearance of the fatty tissue. The epidermis and dermis did not show any distinct abnormality.

Diagnosis — This is based on the marked atrophy of the adipose subcutaneous tissue as shown by the skin hanging down in folds and on the presence of albumose in the urine.

The condition differs from the atrophy of the adipose tissue of the skin described by Gilchrist and Ketron in a little girl as in the latter condition the affection began with palpable nodules in the

subcutaneous tissue and whitish somewhat morphoealike macules and patches developed while the urine was normal in other forms of atrophic syndromes also the urine is normal

Prognosis — This is serious as the disease has little tendency to spontaneous cure The general health may remain fairly good for years but the patient feels weak and nervous and this greatly interferes with his work

Treatment — All treatments tried have failed but the administration of parathyroid extract seems to be of some slight use

LYMPHO FIBROMATOSIS

This is a condition of elephantoid fibrosis observed by Chalmers and myself in Ceylon and Africa (Castellani & Chalmers Manual of



Lympho fibromatosis

Tropical Medicine London 1919) It is sometimes associated with a secondary pyogenic eruption Some cases may be associated with

filariasis but others are not. The skin is elevated into large raised flattened areas of fibrous consistency. The condition is chronic.

SYMMETRICAL PALMAR ERYTHEMA

Chalmers in 1899 drew attention to a symmetrical non pruriginous palmar erythema found in Europeans on the Gold Coast and extending along the ulnar side of the palms of the hands. The affection was very persistent. I have seen cases in Ceylon and other tropical countries.

ERYTHEMA PERIANALE PERSTANS

This condition is not rare in Europeans living in the tropics especially with a delicate white skin.

A circular erythematous zone is seen occupying the perianal region which does not itch or show inflammatory signs there being no swelling or infiltration or tenderness.

The border of the erythematous zone is abrupt but not redder than the rest of the patch and not elevated. The condition persists for many months and even years without exudation or eczematoid changes.

No fungi are found.

A lead lotion may be used such as $\text{Liq plumbi fort grm } 4$ $\text{zinci ox grm } 6$ $\text{glycerine grm } 2$ $\text{Aq dest ad grm } 200$.

An ichthyol paint seems to be useful. $\text{Ichthyol grm } 4$ $\text{aq dest ad grm } 30$.

OCHRODERMATOSIS

While in Ceylon I came across among Europeans living in the low country three cases of a peculiar generalised yellow pigmentation of the skin which I did not think was ordinary carotenosis (aurantiasis) as none of the patients was having a diet rich in carrots.

oranges yellows of eggs etc Moreover the pigmentation disappeared rapidly on the patient going to the hills They were not taking any medicine nor exposing themselves to the action of any toxic substances and they were certainly not taking picric acid which as well known gives a diffuse yellow pigmentation of the skin and is much used by malingerers to simulate jaundice In those days atebirin was unknown The pigmentation was a bright yellow or saffron colour quite different from the yellowish greenish colour of jaundice The sclerotiae remained completely white and the urine was of normal colour and composition The sweat was not coloured The general health was in no way affected but naturally the patients greatly objected to the disfigurement The condition disappeared on the patients going to a cool climate without any treatment or change of diet

A detailed description of the condition may be found in Castellani & Chalmers *Manual of Tropical Medicine* London 1919 (pag 2236)

XANTHODERMA AREATUM

This affection which has been described by me in Castellani & Chalmers *Manual of Tropical Medicine* (all Editions 1910 1913 1919 (p 2237) is not infrequently met with among Europeans it generally affects the lower parts of the legs it starts very insidiously with a yellowish or reddish yellow spot which is not elevated the surface is smooth not furfuraceous there is no infiltration and apart from the colour the affected skin is normal There is no pruritus and no pain The yellow spot slowly increases and one or more other spots may appear near the first one or at a distance Some of the spots may coalesce together forming a large yellow red patch of irregular or various outline The larger patches also apart from the colour are normal being of normal consistency and elasticity The disease is very chronic The general health is not impaired the lymphatic glands are not enlarged and the blood does not show any abnormality urine normal In all my cases syphilis could be excluded in none was there any history of traumatism

Diagnosis — From chloasma xanthoderma areatum is readily differentiated by the lighter yellow or yellowish red colour and by

the different situation. The affection can be easily distinguished from vanthoma as the texture of the skin is normal and the patches are not elevated. In pseudo vanthoma elasticum of Balzer there is an eruption consisting of mesh like patches of buff coloured infiltration lumpy in some places in others linear. It must be distinguished also from Schamberg's so called «cayenne pepper» condition characterized by the presence of brownish yellowish patches on the legs made up of small puncta giving rise to cayenne like appearance of the skin found at times on people suffering from varicose veins.

Treatment — This is difficult in some cases an energetic exfoliation treatment by resorcin pastes (resorcin grm 1 ac-salic grm 1.30 Lassar's paste grm 30) improves the condition after the inflammation induced by the paste subsides.

MELANONYCHIA FALCIFORMIS

In Ceylon I have described in two European ladies a peculiar condition of the nails characterized by a band of black pigmentation along the free border of the nail. On superficial examination it has the same appearance as though some dirt has accumulated beneath the free border of the nail but on scraping this pigmentation does not disappear and this shows the condition is due to some pigmentation in the substance of the nail. No fungi were present. The sufferers were in general good health not using any internal or external medicine or cosmetic which could account for the pigmentation and the nails apart from this line of pigmentation appeared perfectly normal. Later I came across a case in a European gentleman in the same country and I have seen another case in Macedonia.

The condition slowly disappears spontaneously.

CHLOASMA SYMMETRICUM

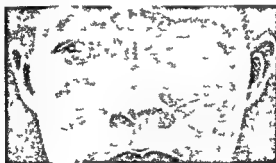
This condition which has been described by me (Castellani & Chalmers Manual of Tropical Medicine all editions) is often met with in Singhalese who greatly object to it. This is characterized by

the presence of two dark brownish chloasma patches situated symmetrically one on each cheek generally on the malar region. In some cases in addition to these two patches a third one is found on the nose. The colour of the patches is generally dark brownish very rarely bronzine. The causation is unknown it does not seem to be congenital. No treatment is of any avail.

CHLOASMA BRONZINUM

This somewhat rare affection is met with among individuals of the Indigenous Races as well as Europeans in India, Ceylon, the Malay States, China and other tropical countries.

Etiology — This is unknown but a life in the open air with daily exposure to a tropical sun is apparently an important predis-



Chloasma symmetricum

posing cause. All my patients were European planters or native overseers of coolies.

Symptoms — Part of the face or the neck or occasionally the whole face, neck and chest presents peculiar pigmentation resembling a black bronzine mask. The pigmentation areas slowly but steadily increase. The disease is very chronic and incurable if the patient remains in the tropics. The general health is not impaired. The

examination of the various organs is negative. The blood and urine are normal.

Diagnosis — This is easy even in very dark skinned natives the affected parts being completely black and having a characteristic bronzine hue.

From ordinary chloasma which is not rare — especially among women — the affection is easily distinguished by the bronzine tint. The absence of asthenia, loss of flesh and diarrhoea will suffice to distinguish chloasma bronzinum from Addison's disease; the history and examination of the blood will differentiate it from malarial pseudo Addison's disease; the examination of the urine will distinguish it from diabetes bronzinum. Argyria will be excluded by the history by the fact that in chloasma bronzinum the mucosae are not affected. In ochronosis the cartilages, ligaments and fibrous structures become pigmented and the discolouration is best seen about the knuckles and tendons of the hands and feet; moreover the urine often blackens on exposure to the air (alcaptonuria).

Prognosis and Treatment — The disease seems to be incurable but a long stay in a temperate one generally improves it especially if combined with a cure of waters at Vichy or Montecatini.

DERMATOSIS FISTONATA FRONTALIS

Historical and Geographical — The condition has been described by me in Ceylon (see *Castellani and Chalmers Manual of Tropical Medicine* 1919 pag. 2234).

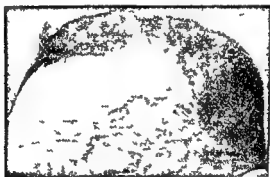
Etiology — This is unknown but probably a continuous exposure to the sun and glare plays a certain role in the causation of the malady.

Symptomatology — The affection which in its severe type is rare is found in Europeans who have resided for many years in the tropics and who have lived an open air life such as planters and overseers exposing themselves to the sun for long periods of time.

In a well marked case there is a festooned margin at times slightly raised often of vivid bright red or coppery red colour while the skin which it encircles has a peculiar whitish occasionally leucoderma like appearance and may be slightly atrophied or at times small patches of hyperpigmentation may be present. There is very little or no pruritus and sensation to the touch pain heat and cold is not impaired.

The course is extremely long the affection slowly expanding peripherally and in a tropical climate has no tendency to spontaneous cure.

Diagnosis — The affection is not rarely taken for a trichophytic condition but the microscopical examination for fungi is always



Dermatosis festonata frontalis

negative and an antimycotic treatment does not induce any improvement. From a syphilide it is differentiated by the negative Wassermann and by the uselessness of salvarsan potassium iodide and other antisyphetic medication; from leprosy by the sensation being normal.

Prognosis — The general health of the patient is not affected but the condition has no tendency to spontaneous cure in the tropics. It gets much better if the patient goes to reside in a cold country.

Treatment — The treatment is very unsatisfactory. The patient must be advised not to expose himself to the sun and glare though it is doubtful whether the condition is due simply to such exposure. A wide brimmed topee or sun helmet lined with red cloth may be used.

Of the many drugs tried ichthyol seems to be the only one which at times keeps in check the condition occasionally inducing slight improvement. It is given internally in 5 grain (0.30 gram) doses three times daily before meals and an ichthyol ointment or lotion (5 per cent) may be applied to the affected skin at night while during the day a calamine lotion may be used.

Mercury potassium iodide and arsenical preparations as well as antibiotics and vitamins are useless.

SOLAR TRIANGULAR DERMATITIS

In women who wear blouses with a triangular opening at the neck not rarely a peculiar type of chronic solar dermatitis develops limited to the exposed triangular portion of the upper chest and characterized by the presence of diffuse or patchy sunburn and sparse most pruriginous small persistent reddish papules. The pruritus is not continuous but comes in bouts.

In the ordinary type of solar dermatitis and sunburn such papules are not seen and pruritus is usually absent. The treatment is most difficult. Salicylic acid and menthol alcoholic lotions (1%) are useful and of course the wearing of blouses opened in front must be discontinued or red veils may be used. To prevent the condition the following lotion is useful: Salol grm 1 zinc oxide grm 5 menthol grm 1 alcohol purum grm 50 glycerine grm 1 aquae dest ad grm 150. Or the following may be prescribed: salol tannic acid aa grm 2 alcohol purum 100.

After applying the lotion and letting it evaporate the following powder may be used: zinc oxide starch tannic acid ana grm 10. The powder is slightly yellowish.

PSEUDOTINEA INTERDIGITALIS PEDUM
(DERMATOSIS INTERDIGITALIS HYPERCHERATOTICA)

This affection may be connected perhaps with the dermatosis interdigitalis alba (p 2155) but is a much more serious condition I have seen and studied four cases three had been diagnosed by their medical attendants as tinea pedum or athlete's foot although very many antimycotic treatments had been used with no effect The fourth one came to see me without having had previous medical attendance Quite recently I have seen a fifth case in a very early stage

The first impression on seeing this condition is that it is mycotic but microscopically and culturally fungi are completely absent A few cocci and a few bacilli may be present but always in



Pseudotinea interdigitalis pedum Early stage

scanty numbers In one of the two cases sent to me the patient had done such thorough treatment with various antiseptics and antibiotics that agar media and glucose agar media inoculated with scrapings remained sterile on two occasions

The inner and under surface of the toes and webs present a white somewhat margined appearance and there is a well marked diffuse hyperkeratosis with scabrosities but no callosity No vesicles and no bullae are present A few fissures may be present There is no pruritus and no pain The condition remains limited to the regions mentioned and no similar lesions are found on other parts of the foot What is the nature of this affection? It certainly is not of mycotic origin nor in all probability of bacterial origin Is it a condition related to psoriasis flexuralis? No signs of true psoriasis were seen in these cases and according to the history given by the patients and in two of the cases by their doctors there had

never been any signs of psoriasis whether typical psoriasis or psoriasis flexuralis. In the last but one case a biopsy was made but the histological investigation has not shown any specific lesion only hyperkeratosis and some foci the parvicellular infiltration in the dermis. No Monro's intraepidermic microabscesses were noted. It seems therefore to be different from psoriasis. It does not appear to be related to Andrew's bacteriæ as no bullæ are present and in my cases the condition was limited to the toes.

Prognosis and Treatment — The condition runs a chronic course lasting for years and is most difficult to cure. Antimycotics appear to be useless. As all the patients object to the white appearance of the lesions salicylic acid salves should not be used as after a time they make the lesions whiter although much smoother. Two ointments I have found useful a tannic acid ointment (6%) and an ointment with the following formula Hydr. Ammoniat. grm 1.3 Sulphuris præc. grm 1.3 Vaseline grm 30. When prescribing the latter ointment it is advisable to write on the prescription for the benefit of the chemist that the prescribing of sulphur and white precipitate together is made on purpose everybody knowing that the general rule is never to order an ointment containing both these substances owing to the pigmentation which may be caused by their interaction.

The use of a sulphur powder in association with a mercury perchloride lotion (1:1000) for many months is also useful. It darkens the skin but this is just what the patient desires.

ABYSSINIAN GUM TATTOOING

The newly arrived medical man in Abyssinia is often surprised at seeing the peculiar dark bluish colour the gums of many Abyssinian women have. This is due to the habit so many native women have of tattooing their gums with lamp soot. The tattooing is carried out by means of a spine from a native shrub.

XUDIS

The newly arrived European physician in examining natives of Borneo, Java and Malaya is often struck by the peculiar appearance

of the skin of the abdomen. The skin presents a large number of hyperpigmented patches brownish or yellowish roundish or ovaloid or of irregular outline interspersed with smaller depigmented patches so that a sort of mosaic like pattern is produced.

The patches are smooth not raised not pruriginous not painful not tender. Sensation normal. The pigmentation is permanent. The condition is found in every social class even the highest.

This dermatosis has nonplussed many medical men and has been considered by some to be a congenital nevroid condition. In reality the condition is due to the habit native women have in order to prevent chills in their babies to rub into their bellies saliva after chewing betel and at times they actually apply the betel paste. These applications induce erythematous patches followed by permanent pigmentation.

DERMATOSIS INTERDIGITALIS PEDUM ALBA

(Leucosis Interdigitalis Pedum)

The skin of the interdigital web between the 4th and 5th toe and inner surfaces of other toes present a peculiar whitish smooth madreperlaceous appearance with no sign of inflammation or desquamation and no pruritus or other subjective symptoms. No sodden appearance. Fungi are not found but staphylococci and proteus germs may be present in scanty numbers. The aetiology is unknown. Occasionally a similar condition is noted in patients who for months and months have used a salicylic ointment.

Possibly the condition may be the very first stage of the disease described at pag 2073 with the name of Pseudotinea interdigitalis but so far I have not seen any case of the first condition turning into the second.

ACHROMIA FLAVA FACIEI AMYCOTICA AB INITIO

(ACHROMIA NON PARASITICA)

In this condition described by me on the face one or two or three seldom more roundish or ovaloid patches of partial depigment

ation develop which in negroes appear of a yellowish colour. There is no sign of inflammation and no pruritus. The patches which on complete development are usually between a sixpenny coin and a shilling in size are smooth but after some time the surface may take a very delicate minute crinkled appearance which is hardly visible. No fungi are found not even at the very beginning of the development of the patches and this immediately distinguishes the condition from *Pityriasis flava* (*Pityriasis versicolor tropicalis*) and also distinguishes it from the yellow patches which often remain in *Tinea flava* when the fungus has been destroyed or has disappeared as in these patches at the beginning of their development and for some time after. *Malassezia* fungi are always present.

The condition must be differentiated from solar or sunlight pseudotinea *flava guttata* in which hyperpigmentation is present in addition to depigmentation. The latter condition is typically characterized by the presence of numerous small partly depigmented light yellowish or whitish roundish patches on deep sunburn. *Noevus anaemicus* is congenital. *Sabouraud's pityriasis alba* often found in children is of streptococcus origin and the patches appear whitish owing to the presence of minute scales.

I thought at first that the condition was a form of pinta but such cases never progress to complete depigmentation and the Wassermann is negative. No treatment is of any avail but in a few cases the condition becomes cured spontaneously. A brief account of it may be found in the *Journal of Tropical Medicine & Hygiene* Vol. xviii 1 1925 and a fuller one in the same Journal 1939.

INCRUSTATIO UMBILICALIS

(Umbilical Incrustation)

In the tropics and occasionally in the temperate zone especially in people wearing woollen cholera belts or a thick woollen vest the umbilical cavity may show peculiar incrustation like masses of grey whitish yellow brownish or black colouration often firmly adherent to the skin frequently quite hard though not painful. Occasionally these masses may be the starting point of an umbilical and periumbilical dermatitis. Microscopical examination reveals a large amount

of detritus fat globules often woollen fibres bacilli cocci frequently spore like bodies and occasionally articles of mycelium In some cases I have grown *Candida* and *Torulopsis* fungi and in several cases in which the incrustation was black or greenish black I have isolated *Aspergillus* and *Penicillium* The starting point of these incrustations is probably an accumulation of woollen fibres which become caked owing to the secretions of the skin there is then a bacterial and mycotic invasion and the peculiar incrustations are formed The condition is quite easily differentiated from the crusts found in eczema and eczematoid dermatitis which are yellow and soft

SANDAL STRING VERRUCOID DERMATOSIS

In North Africa in Europeans wearing sandals and in natives it is not rare to see a peculiar linear or ovaloid patch on the region between the first and second toe and lower portion of the dorsum of the foot presenting a verrucoid greyish or brownish surface which is usually non pruriginous and seldom tender and quite different in appearance from an ordinary callosity This condition which often nonplusses the medical man just arrived in Africa is due to the chronic irritation caused by the small cord or thin thong which passes through the first and second toes and keeps the sandal in place

BROMIDROSIS FAECALOIDES

(Hypendrosis with faecal odour)

Bromidrosis or sweat with unpleasant odour is frequently observed in the tropics and not rarely in the temperate zone especially in summer I should like to call attention to a peculiar type cases of which I have seen in Ceylon the Balkans and Central America viz the type with faecal odour Although the patient may be extremely clean and bathe two or three times a day he exhales with his perspiration a faecal odour and any room in which he may have been for more than a few minutes has the same odour and becomes uninhabitable In this connection I may quote portions of

a letter I received some years ago from a colleague in Jamaica asking whether I could suggest anything for his son a very intelligent boy who had been kept away from school «the odour of his body is of a disgusting faecal nature The odour permeates his clothes and the room in which he lives although the doors and windows are always kept open He bathes twice a day» The letter after stating that no treatment had been of any avail ended «I am frightfully distracted and feel sad at the future of such a bright boy»

The treatment I have found best in these cases is the administration of salol and calomel kerol capsules and hexamine in addition permanganate baths and the use of menthol or carbolic soaps I may add that in the case of the Jamaica boy I suggested kerol and hexamine and after a few months I received a letter from his father to the effect that the treatment had been successful

MALNUTRITION HYPERTRICHOSIS OF THE LANUGO HAIR OF THE LEGS

This condition described by me (British Med Jour August 2 1947 pag 188) generally affects the lanugo hair of the legs especially the extensor surfaces The hair becomes much thicker and longer and at times darker It is often seen in times of war in children who have been placed suddenly for reasons of necessity on an insufficient diet particularly poor in animal proteins and fat On giving the children again a proper diet the condition rapidly ameliorates and finally disappears

It is interesting to note that the condition is well known to women of the working classes in the South of Europe A woman who for reasons of work or for some other reason has put her children in charge of neighbours or relations will often complain on her return home that the children have not been well looked after and have been starved «as shown by the thick hair on the children's shins»

Malnutrition may cause a depigmentation of the hair of the scalp in a group of children as seen in the disease known as kwashiorko

SYMMETRICAL LANUGO HAIR ALOPECIA

Symmetrical roundish or oval patches of lanugo alopecia seen in both arms both sides of the chest and abdomen both legs. The patches are smooth with no signs of inflammation they are painful nor tender nor pruriginous. The causation is unknown. It has been suggested that it is alopecia areata of the lanugo hair but in my cases no patches of alopecia areata were present on the scalp or the region of the beard.

SUMMER HYPERTRICHOSIS OF THE LANUGO HAIR

In some individuals the lanugo hair of exposed parts especially on the forearms may get thicker and longer during the summer months. The condition seems to be more common in fair haired individuals.

WINTER HYPERTRICHOSIS OF THE LANUGO HAIR

In a few individuals hypertrichosis of the arms and legs has been observed in the winter months.

CHEILITIS CRUSTOSA EPIDEMICA

During the Ethiopian War (1935-1936) a number of soldiers suffered from a peculiar cheilitis which although not preventing their attending to their usual duties caused them a great deal of discomfort and annoyance.

It was especially common in troops after long marches on dusty roads. The dust irritates the lips and minute cracks appear and soon the lower lip shows a diffuse moist surface the secretion of which dries up in thick rupoid crusts. In this stage pyococci are always present. The patient suffers great discomfort in eating talking and there may be salivation.

The condition lasts for several weeks. To prevent it the soldiers used to protect their mouths and lips with a large handkerchief which they tied up at the back of the neck.

The treatment consists in applying boric solution (2%) followed by a weak salicylic ointment ($\frac{1}{2}$ 1%)

To prevent the condition anointing the lips with oil, theobromatis or glycerine or boric vaseline is useful.

A complete description of the disease may be found in my Manual of the Diseases of Africa (Malattie dell'Africa Roma 1947)

PITYRIASIS LINGUÆ SPIROCHÆTICA

This condition has been described by me (Castellani & Chalmers Manual of Tropical Medicine 1919)

There is as a rule no sign of inflammation and no ulcers but the dorsum of the tongue is covered by a thick persistent whitish yellowish or greyish brownish fur which on microscopical examination seems to consist solely of innumerable spirochaetes with some epithelial cells. Of course a few spirochaetes are always found in scrapings from the tongue but never in such enormous amounts.

PIGMENTATIONS OF THE TONGUE

Various pigmentations of the tongue are common in the tropics and as a matter of fact also in the Temperate Zone. They may be separated into (a) congenital (b) acquired. Those of the second type may be distinguished in practice into the following groups: (1) Pigmentations usually evanescent or temporary due to certain foods (oranges chocolate etc.) to chewing tobacco and over smoking (tobacco brown tongue) to chewing betel (betel red tongue Ceylon red tongue *vide infra*) to medicines containing iron to the use of certain dental preparations and local disinfectants. (2) Pathological pigmentations which may be of known origin — e.g. mycotic pigmentation — or of unknown origin.

LINGUA NIGRA (BLACK TONGUE)

On the dorsum of the tongue especially in the posterior portion one or several black blackish blue or brown blackish patches are seen consisting of hair like epithelial filaments or projections of from 1/6 to 1/12 inch in length The condition is due to overgrowth of the papillae which are enlarged and elongated it is in fact a hyperkeratosis and elongation of the papillae (hairy black tongue) In some cases however the patches are fairly smooth and the hair-like processes are not seen (smooth black tongue)

The condition is persistent but after some months or a year or two it has a tendency to disappear spontaneously Three aetiological types of Lingua Nigra may be distinguished (a) the bacterial type (lingua nigra bacterica) (b) the mycotic type (lingua nigra mycotica) (c) the non bacterial non mycotic type (lingua nigra abacterica et amycotica or simply lingua nigra amycotica) In the bacterial type described by me pigment producing bacteria are found in scrapings from the affected parts among which frequently a Gram positive sporogenous bacillus of the *Bacillus subtilis* type which produces a dark brown pigmentation in certain media such as glucose agar and potato In the mycotic type fungi producing a dark brown or black pigment — actinomyces and other fungi — grow on the elongated and keratinized papillae making them appear black In the abacterial amycotic type no pigment producing fungi or bacteria are found In cases of carcinoma of the mouth and of the stomach a black pigmentation apparently of this latter type is occasionally seen

In several severe cases of lingua nigra in New Orleans and later in England I found a spore forming Gram positive non acid fast bacillus of the *B. subtilis* type It grows well on the ordinary laboratory media On glucose agar the colonies are smooth or somewhat granular and rather dry they have a brown dark brown or black pigmentation especially marked at the periphery On potato the whole growth may be black or portions may be brownish, and others black the surface is often covered with a whitish «duvet» as is the case with certain fungi Gelatine and serum are liquified rapidly No gas fermentation in any sugar and other carbohydrates Acidity produced in glucose levulose maltose saccharose salicin no acidity in lactose mannitol rhamnose xylose It is not pathogenic to the usual laboratory animals This organism belongs to the aerobic spore bearing bacilli of the usual laboratory animals This organism belongs to the aerobic spore bearing

bacilli of the *B. anthracis*, *B. subtilis*, *B. mesentericus* group I considered to be a type or variety of *B. subtilis* (*B. subtilis* var. *negrolinguae*). It may possibly be identical to *B. mesentericus niger*.

Thompson and Montgomery and other observers have isolated various fungi of the genus *Actinomyces*. Several observers have described yeast-like fungi. Wedmann found in a case an *Actinomyces* which he identified with *Actinomyces nutissimus*. The patient, a diabetic, was suffering from a pythiasis.

According to Pirin, in cases of *Lingua nigra* (*actinomyces*), the pigment contains iron and is produced by a chemical reaction between the haemoglobin in the blood and certain sulphur and ammonium compounds derived from the decomposition of protein debris or tobacco.

Treatment — The local application of hydrogen peroxide or with care of an alcoholic solution of salicylic acid (2 per cent) after scraping is useful.

A simple method which is often successful is to soak the black hairy patches with pure hydrogen peroxide and to clean off the parts by means of a soft dental brush afterwards treating the whole dorsum of the tongue with 10 per cent argyrol. Some authorities recommend rubbing the silver nitrate stick well into the black area; superficial sloughing follows in a few days and generally there is no recurrence.

CONGENITAL BLACK TONGUE

Dark or black patches are often seen on the tongue of individuals of Coloured Races and until fairly recently they were believed to be by many tropical practitioners a sign of ancylostomiasis. These are deeply pigmented, smooth, non-elevated patches, roundish or oval and may be found also on the gums, on the mucosa of the lips and on the soft and hard palates. In my experience they are not in any way connected with ancylostomiasis and are congenital. They do not disappear after the patient has got rid of the ancylostoma infestation.

LINGUA RUBRA MYCOTICA

This is a very rare condition, a typical case of which was put on record by Ruth Stone Alvares in 1926. On the dorsum of the tongue a patch is seen with the appearance of a «crop of red grass» which

can be easily removed by scraping. The patch consists of numerous red filiform bodies which are in reality elongated tissue fibres — they are considered by most authorities to be the elongated and hypertrophied filiform papillae — on the surface of which a red pigment producing fungus grows abundantly. Alvares described the fungus found in her case as a *Torula* — not *sensu* Langeron but as a synonym for *Torulopsis* (*Cryptococcus*) — which grew on artificial media producing red colonies and did not acidify or gas ferment any sugar. I have come across a similar case in North Africa the fungus appeared to be a strain of *Torulopsis pararosea* (*Cryptococcus pararoseus* = *Monilia pararosea* = *Candida pararosea* = *Rhodotorula mucilaginosa* var. *pararosea*).

PURPLE TONGUE OF CEYLON

The newly arrived European medical man is not rarely puzzled by the bright purple colour of the tongue when he examines patients of the popular classes in Ceylon and many other countries in the Far East.

The pigmentation is simply due to their habit of chewing betel and slowly disappears when the habit is discontinued.

Betel is a mixture of the leaves of *Chavica betle* (piper betel) with slices of the nut of *Areca cberacea* (Pinang or areca nut palm) and lime. Betel stimulates the salivary glands and it is said those of the digestive organs. It diminishes the perspiration. The irritation may be the cause of the commonest cancer of old people in these parts.

SUMMARY

At the request of many colleagues and students the Author gives once more short descriptions of a number of little known tropical diseases most of them investigated by himself adding the results of recent etiological, clinical and therapeutic researches on the subject. Among the internal diseases and syndromes discussed are among others: Enterorheumatic fever, Febrile Hepato Splenomegaly with arthritis, Polyphlebitis Tropicalis, Febris columbensis, Febricula asiatica, Non specific insect fever, Non malarial Quartan fever, Febris Pluridie, Endemic Funiculitis, Pseudo surgical Syndromes of malarial and amoebic origin, Bacterial Foetor oris, etc.

cosis (1935) Galactosuria (1978) Ghabli Syndrome (1896) Harmattan Syndrome (1896) Heat Edema (1892) Insect Fever (1906) Khamsin (1897) Lactosuria in the Tropics (1975) Land Wind (1897) Langde Chat Glossitis (1921) Lepothrix Stomatitis (1926) Lepothrix Thrush (1926) Leukokeratosis Lingualis Hypertro (1924) Lingua Nigra (2178) Little Known Tropical Dyspepsias and Diarrhoeas (1942) Little Known Tropical Surgical Diseases and Syndromes (1984) Low Amoebic Fever (1901) Macroglossia Mycotica Candidiaca (1932) Malignant Membranous Stomatitis (1927) Malignant Tumour Syndrome of Amoebic Origin (1989) Maltosuria (1977) Metadysenteric Cystitis (1973) Micrococcus Myceticus Pseudo actinomycosis (2015) Micrococcus Myceticus Pseudomycosis (2015) Microvesiculosis Sparsa Cutis Glabrae (2012) Moonstroke (1899) Morbus Boreae (1896) Motor Bicycle Riders Abdomen (1943) Mycotic Urethritis with Whitish and Yellowish Discharge (1969) Mycotic Vaginitis (1971) Mycotic Vaginitis with Black Discharge (1973) Mycotic Vaginitis with Red Discharge (1973) Mycotic Vulvovaginitis (1972) Non Malarial Quartan Fever (1899) Ocular Emetine Constrict Syndrome (1980) Otomycosis (1982) Panperos (1897) Paronichia actinomycetica (2072) Pentosuria (1979) Pes Dolorosus (1894) Polyphlebitis Tropicalis (1943) Pseudo Framboesia (2008) Purple tongue of Ceylon (2180) Pyoderma Cupuliforme (2008) Pyoderma Nodulare/Tropicale (2008) Pyosis Follicularis Crurum (2011) Pyosis Mansonii (2006) Pyosis Nodularis Tropica (2008) Pyosis Nodulo Crustosa Tropicalis (2008) Recurrent Parotitis (1931) Red Mycotic Urethritis (1970) Red Sea Edema (1892) Rhinomycosis (1983) Rome Gardens Fever (1908) Sand Storms (1898) Stomatitis Cryptococco Bacillaris (1920) Stomatitis Erythematosa Guttata Pruriginosa (1926) Stomatitis Membranacea Maligna (1922) Stomatitis Mycotica Fusca (1926) Sudan Edema of the Eyelid (1981) Symmetrical Ear Nodules (1983) Tea Tasters Cough (1940) Tonsilloblastomycosis Follicularis Pro Parte (1935) Tonsillocandidiasis Pro Parte (1935) Tonsillomoniliasis (1937) Tonsillooidiomycosis (1939) Tonsillooidiosis Follicularis (1935) Tonsillomycoses (1934) Tonsillomycosis Diphtheria Similis (1936) Tonsillomycosis Follicularis (1935) Tonsillomycosis Fusca (1940) Tonsillomycosis Membranacea (1936) Tonsillomycosis Spiculata (1939) Tonsillomycosis Spinulosa (1939) Toxoplasmosis (1911) Traumatic Pappatai Fever (1906) Tropical Abdomen (1942) Tropical Colon (1942) Tropical Impetigo Bockharti (2011) Tropical Non Specific Intermittent Fever of Children (1905) Tropical Pyodermata (2005) Tropical Tumay (1942) «Ulcers of the leg» (2018) Ulcus Oris Perstans (1925) Urethromycoses (1969)

